UNIVERSITY OF TWENTE.

Redesign IT Organisational Structure

Case study of Centre for Data and Informatics Infrastructure (CDII) Ministry of Communication and Informatics Republic of Indonesia

Master Thesis

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2019

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Abstract

Every organisation needs information technology (IT) to support many activities and handling its business processes and ideally, an institution formed an IT organisational structure to manage it. The Centre for Data and Informatics Infrastructure (CDII) is a work unit within the Ministry of Communication and Informatics of Indonesia (MCI), which manages IT services in the organisation. However, the present structure of CDII was created in the past, in order to address the needs of the day. This structure does not optimally address the current needs of MCI Consequently, it would be better to align the structure and functions of CDII to the IT processes and the business goals of MCI. This would allow to optimise resources and IT investment and provide services effectively and efficiently. For this reason, comprehensive analysis to create an ideal organisational structure for CDII is needed. In the preliminary study, we look at the underlying theory of IT Governance in order to create a strategy for this project, and we conduct a literature review to determine the suitable framework. COBIT 5 framework is selected because it gives practical guidelines and it is widely known among practitioners. An additional reason for this choice is that COBIT is widely used among government organisations in Indonesia. The result show that for assessment of current condition, from 37 COBIT 5 domain processes, there are only six COBIT 5 domain processes (16%) included in the CDII organisational structure. A proposed model for CDII is created based on analysis of COBIT 5 processes, CDII process framework, and feedback from CDII management. This model would have two divisions under CDII: a division of IT Planning and Development that focus on planning, building and monitoring processes and a division of Operational and IT Service Management for building and running activities. Under each division there are three sub-divisions that support IT related activities in organisation. The new structure is better able to accommodate COBIT 5 processes for governance of enterprise IT compare to the previous structure.

Table of Contents

List of Figures

List of Tables

1 Introduction

In this chapter, a background on the subject of the research study will be presented as well as the project context, research purpose, method for this study.

1.1 Background

Information technology has become an integral part of every organisation. From multinational corporations who maintain mainframe systems and databases to small businesses that own a single computer, IT plays a role. The reasons for the ubiquitous use of IT in the industry can be discovered by observing how it is used across the business functions. It is an essential aspect for every organisation to maximise decision making for an operational, tactical, and strategic level. IT investment takes a vital part of the annual budget for any organisation (Steuperaert, 2017). Therefore, an organisation should focus on the governance and management of IT to make sure to align the current and future investments in IT with business goals, and IT-related risk is appropriate for the organisation.

The IT department for any organisation today is critical. The IT function's objective is changing from merely supporting business operation into shaping business strategy and adding value to the enterprise. When the organisation urges to maximising the value of IT, the needs for defines function in the IT department that cover business requirements from end-to-end is also increased.

"How do we divide the work in our IT Department?"

This question arose during the conversation with an employee in the IT department. Based on the discussion, we believe that If everyone in an organisation understands their job description, the better coordination can be achieved. Additionally, they will likely perform well and feel secure within the scope of their responsibilities. Furthermore, Boar (1998) stated that the organisational design remains an art because it needs to choose a most relevant strategic dimension for current times and circumstances such as geography, function, process, or market as prescribed by a strategy. Additionally, designing IT organisation holds challenges from both macro and micro level. The macro level issued the problem of roles and responsibilities, placement of business units, and governance relationship to other IT entities within the business. While micro design questions of how a specific IT organisation should organise itself internally to deliver their duties efficiently and effectively.

1.2 Problem Statement

Centre for Data and Informatics Infrastructure (CDII) is an echelon II unit at Ministry of Communication and Informatics. Based on ministerial regulation No.1 of 2016, CDII is one of the supporting elements to run public services for citizen and. Even though structurally positioned under Secretary General, it also has a responsibility to report to the Minister of Communication and Informatics. Their duty includes the implementation and the support for Indonesian government's priority programs. The program is to make sure that an integrated and safe e-government services is availability. However, various obstacles related to IT management still occur in CDII. Preliminary discussion with the client shows that there is a lack of data integration between work units in the Ministry, absence of IT control functions, and insufficient risk management. These problems indicate that the IT organisation need to be improved. Moreover, there is need to anticipate the rapid change in strategic policies and organisational environments. Thus, it is necessary to conduct a study of CDII.

The urgency to perform the study is enforced with the issuance of two regulations supporting the implementation of IT governance in the Ministry of Communication and Information. Fist, the Ministerial Decree Number 1155 of 2015 about the Establishment of the Information Technology Committee of the Ministry of Communication and Information. Second, the Ministerial Decree Number 1156 of 2015 concerning the Establishment of Technology Management Information from the Ministry of Communication and Information Technology. Both regulations require that IT-related processes, from the initiation to the termination, must be carried out by CDII. Therefore, they require an IT management structure that able to carry out end-to-end IT life cycle activities. However, the current organisational structure is still far from that. Given the current circumstances, the question about how the CDII organisational structure should be so that it can manage IT life cycle processes and implement good IT governance, is arise.

This chapter consists of the goal that is set for this research, the research questions that are framing our project and the choice of methods that will be used in this thesis. The report aims to find the most suitable IT organisational for CDII by conducting empirical research.

1.3 Research Question

The main research question that needs to be answered in this master thesis project is "What would be a suitable structure for CDII to govern and manage IT successfully?". We construct four research questions to conduct our research systematically. Below are the research questions that necessary to answer to achieve our main research goal:

Research Question 1: What a suitable framework to redesign IT Department's division for CDII project according to the literatures?

Research Question 2: How could the chosen framework in RQ1 be applied to redesign the IT department?

Research Question 3: What is the current condition in CDII as described by the chosen framework?

Research Question 4: What is an appropriate organisational structure for CDII to achieve its goal?

Literature study will be used in this thesis, particularly to answer *RQ1* and *RQ*2 to determine suitable tools and protocols to conduct the research based on the chosen framework. The answer will also help us to develop research plan, including the interview questions that will help us to answer *RQ3* and *RQ4*. Understanding the current business process, i.e., the as-is condition of the organisation, and its future direction is necessary to create a new IT organisational structure. In addition to numerous internal documents, we will interview employees from different division. This will provide us more insight to help us formulate the recommendation for *RQ* 4.

1.4 Methodology

In this section, the research methodology used in this paper is presented. Peffers et al. (2008) suggest DSRM (Design Science Research Methodology) for the development of information system research to help the process of building innovative artefact. Figure 1 describe the activities within DSRM.

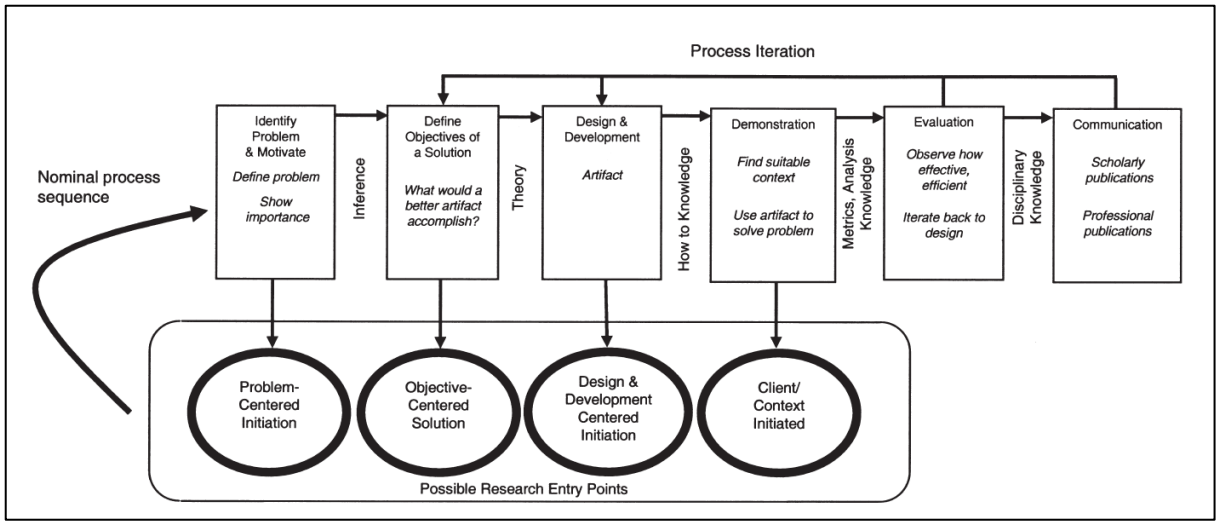

Figure 1. DSRM Process (From Peffers et. al, 2008)

Figure 2 maps the thesis structure into the DSRM method. The first step is to identify problem as we had elaborated in Section 1.2. Then, objectives of solution will be defined through literature review. The result of the review will answer *Research Question* 1 and *Research Question* 2. The literature review method will be explained in the Section 1.4.1. After that, we will perform the design and development, demonstration, and evaluation. These phases will answer *Research Question* 3 and *Research Question* 4 consecutively. The method we will use for the evaluation is in form of case study through interviews. We will the interviews procedure in Section 1.4.2. Lastly, the final phase of this research is communication, where we will cover by reporting our findings and recommendation to our client.

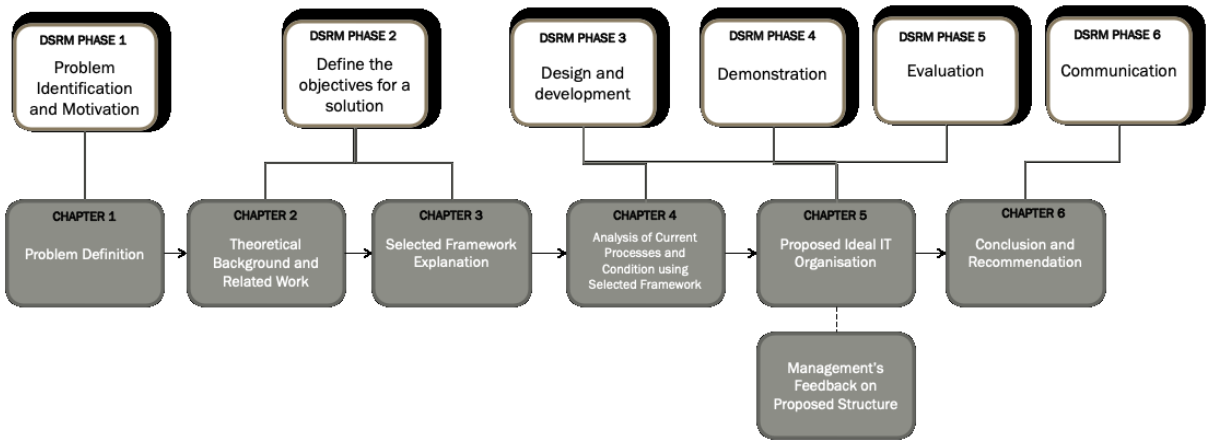

Figure 2. Chapter Description and Mapping to DSRM

1.4.1 Literature Study

In this research, literature study is essential to gather information that can be used to develop a model to perform a case study. By using Wolfswinkel et al. (2013)'s grounded theory for reviewing literature, more useful information can be extracted to determine a new angle for research. Wolfswinkel et al. describe that the method consists of five stages; first, the 'Define' stage is to identify the most suitable data set. In this phase, the inclusion and exclusion criteria are set. Next, the 'Search' stage is the actual search for the studies performed. The third stage 'Select' is done to refine the sample of studies. The fourth stage is 'Analyze', which shows how qualitative research methods extract value from the selected papers. Lastly, 'Present' stage is to write a coherent overview paper, which should show not only the findings and insights obtained but also the critical decisions during the review.

Appendix 1 presents a step-by-step grounded theory method for this research. Besides the paper that produces by scholars in this research area, internal and external documents of DCII and relevant regulations in Indonesia also examined thoroughly. In the case of this project, the documents that will be used are provided by the DCII and online search. These data collection complement the interviews and help us obtain more relevant insights.

1.4.2 Interview

Interview is one of the forms of qualitative research approach that aims to collect detailed information about research question. It suitable for a research that wants to gain as much information in a depth manner. Concerning research goals, the interview is used as the primary data collection for case study. This approach can engage participants directly in a conversation to generate deeply contextual, nuanced and authentic accounts of participants' experiences. Therefore, interviewing facilitates a process that not only makes lived experiences explicit but also re-evaluates participants for personal insights. Structured interviews, semi-structured, and unstructured interview are known as a common type of interview. As for this study, semi-structured interviews will be used since the interviewer has an overall theme of questions to cover but is flexible to adjust depending on the flow of the conversation (Oates, 2006). It also allows the interviewer to add new questions, which might come up during the interview. This method is ideally suited for this project because it will enable the interviewees and interviewer to discuss their thoughts and emphasis on the compelling issues.

1.5 Report Structure

This document is structured as follows: the report begin with chapter 1 in which it describes the theoretical background and related works that are used for designing IT organisational. Next, the choice framework and a strategy to conduct research based on it will be explained in chapter 3. In chapter 4, current condition in organisation and gap analysis will be presented to give insight for the proposed IT organisation's structure. Furthermore, the result of case study will be suggestion of a new organisational structure for CDII is explored in chapter 5. Finally, a conclusion and recommendation will be described at the end of the report.

2 Theoretical Background

This chapter establishes the theoretical background and framework to carry on the rest of the research. By exploring related studies and existing practices from other scholars, the concepts of IT governance for public organisation, IT organisational structure and its primary framework are discussed below.

2.1 Related Work

Specific IT organisational design research is hard to find. Most of the research done in designing organisational structure is from the management area point of view. Especially developing IT organisational structure for the public organisation is kept internally at the organisation, due to the classified nature of data, the uniqueness of the case and the importance of the result. An organisation that provide their data for analysis use the result on their own, so no need to share with others. This conflicts with the purpose of scientific study, to provide publicly accessible information that can be used for further research. This is one of the reasons that there is a lack of scientific papers publicly available. Typical research that examines IT function in the organisation belongs to IT governance area, though many papers are more focused on IT auditing purpose. However, albeit the scarcity of paper on designing IT organisational structure, several literatures provide similar research.

In a study performed in Indonesia, Ghozali & Shodiq (2012) investigated the IT department of a local government agency to design a better structure using COBIT 4.1 framework. Using cascade goals in COBIT, the authors derived IT goals from the business goals of the organisation and then grouping IT process based on each of the current division to determine ideal structure using gap analysis. Hanifi & Latif (2013) also researched a private university in Malaysia to examine the governance structure of the IT function by defining its structures, processes and mechanisms. COBIT 4.1 also used as a guideline to assess all the processes within the IT function, and for identifying a structure for a governance framework for the campus, an investigation was done on the IT units in the selected IT function. The authors interviewed with the different department staff and distributed a set of similar question which was adjusted to recognise the roles and responsibilities of each unit within the IT function. Based on the result, this method was able to identify the problems in the IT function, and thus researchers can give their recommendation.

There are also some papers regarding IT governance structure in the Public sector around the world. Regarding our project domain, we investigate closely similar research in Asian countries. Olyaee (2009) presented an architecture for IT organisational structure including national board and IT committee for the Iranian government. They mapped IT structure in architecture layer from enterprise architecture with top management roles of their country. Even their scope is larger than our project, this paper gives insight that IT structures need to develop and move toward the maturity and thus giving a similar structure for the all organisations is impossible. Besides, the authors stated that maturity must be proportional to the applications of IT at the organisation level.

Al Qassimi & Rusu (2015) conducted a research in which they reviewed IT governance implementation for public organisation in developing countries around Asia by analysing IT Governance practices in place. The authors found that there are some problems and restrictions faced by the IT department in budgeting and decision-making due to the nature of the governmental organisation has different rules and common law that the organisation should comply.

2.2 IT Governance Defined

Reviewing the research papers in this field, IT organisational structure study place as part of the IT governance research. Consequently, begin to understand IT Governance theory is a necessary effort to select the right model for this project. The concept of IT Governance itself has received significant attention in the academic literature since the late 90s. From the practitioner, ISACA formed the IT Governance Institute (ITGI) (www.itgi.org) in 1998 to promote the IT governance concept.

The variety of study also led to a diversity of meanings of IT governance that emerged over the two decades (De Haes & Van Grembergen, 2004; Webb et al., 2006). Some notable definition among them is Weill and Ross (2004) that define IT governance as the decision rights and accountability framework to encourage behaviour in the use of IT. They identify three components of governance; IT Decisions Domains (What are the key IT decision areas?), IT Governance Archetypes (Who governs the decision domains and how is it organized? Who decides or has input, and how?) and Implementation Mechanisms (How are the decision and input structures formed and put in place?).

ITGI defines IT governance is the responsibility of executives and the board of directors and consists of the leadership, organisational structures and processes that ensure that the enterprise's IT sustains and extends the organisation's strategies and objectives (ITGI 2005). IT governance also describes as the strategic alignment of IT with the business such that maximum business value is achieved through the development and maintenance of effective IT control and accountability, performance management, and risk management by Webb et al., 2006.

According to Gartner IT governance is defined as the processes that ensure the effective and efficient use of IT in enabling an organisation to achieve its goals (Gartner, 2012). Although the lack of consensus is present, it appears that these definitions focus on the same issues in which linking business and IT to achieve goals and the responsibility of the Board. The fundamental element in IT governance is the alignment of the business and IT to lead to the achievement of business value.

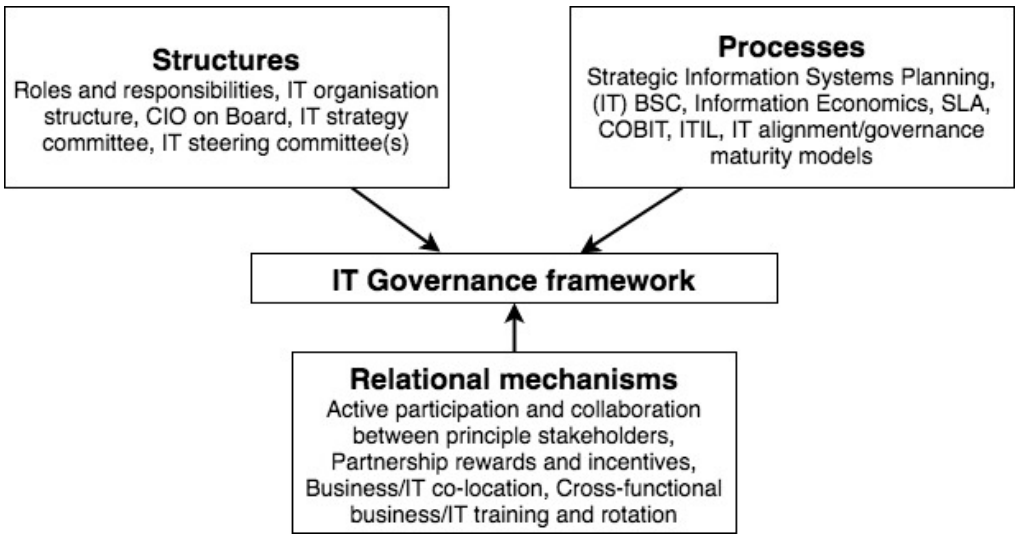

Figure 3. Elements of IT Governance (from De Haes & Van Grembergen, 2004)

Since IT Governance is a very complicated and broad concept, researchers proposed the state-of-the-art view that IT governance should be implemented as a holistic set of structures, processes, and relational mechanisms (De Haes & Van Grembergen, 2004; Peterson, 2004). As visualized in Figure 3, the model is adapted from De Haes & Van Grembergen (2004). However, deciding mixtures of these components is a complex and challenging task, in this manner, it ought to be perceived that what works for one organisation might not work for another. This implies various relations require a mix of

multiple structures, processes and relational mechanisms (De Haes & Van Grembergen, 2004). In Table 1, De Haes & Grembergen proposed a comprehensive association of IT governance structures, processes and relational mechanisms based on Peterson's framework.

Table 1 Structures, Process and Relational Mechanisms for IT Governance (from De Haes & Van Grembergen, 2004)

	Structures	Processes	Relational Mechanisms	
Tactics	IT executives and accounts Committees and councils	Strategic IT decision-making Strategic IT monitoring	Stakeholder participation Business/IT partnerships	Strategic dialog Shared learning
Mechanisms	• Roles and responsibilities • IT organisational structure • CIO on board • IT strategy committee • IT steering committee (s)	• Strategic information systems planning • Balanced (IT) scorecards • Information economics • Service level agreements • COBIT and ITIL • IT alignment/governance maturity model	• Active participation by principal stakeholders • Collaborations between principal stakeholders • Partnership rewards and incentives • Business/IT colocation	• Shared understanding of business/IT objectives • Active conflict resolution (non-avoidance) • Cross-functional business/IT training • Cross-functional business/IT job rotation
Based on: "Information Strategies and Tactics for Information Technology Governance", *Strategies for Information Governance*, Idea Group Publishing, Pennsylvania, USA, 2003				

2.3 IT Governance for Public Sector

This section gives the brief explanation about public sector characteristics and how are these attributes influence implementation of IT Governance. Regarding the project context for this research, it is essential to obtain knowledge about IT governance practices and theories in the public sector with the purpose to select the right model to analyse IT organisational structure for the government agency. To distinguish between the public and private sector, different perspectives and approaches can be used. Campbell et al. in 2017 describe public and private sector organisations in four quadrants based on the level of government or market influence on ownership and control as displayed in Figure 4. They also compile several critical differences between public and private sector in their paper. Table 2 presents essential differences between public and private sector based on multi-factor such as organisational structure, corporate governance structure, the capacity of IT, organisational IT competence, market competition and stability, government regulations and policies according to Campbell et al. (2017).

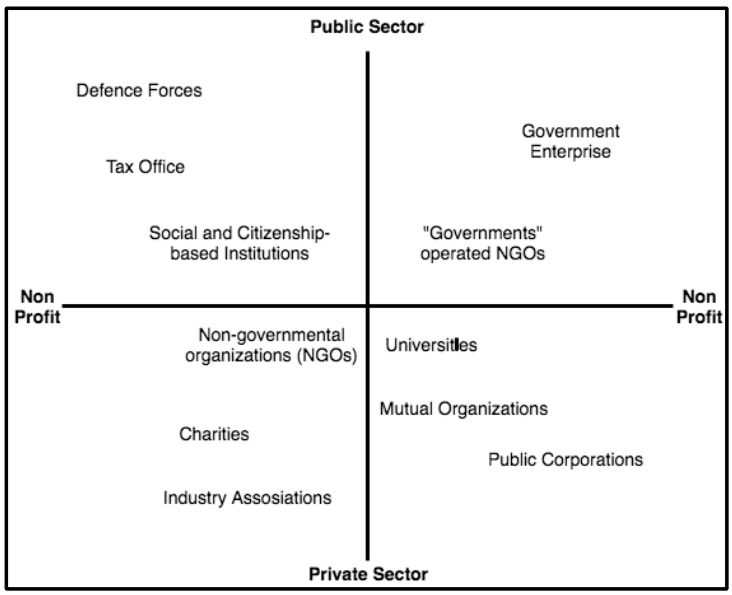

Figure 4. Profit Motive for Private/Public Organisations (from Campbell et al., 2017)

In general, public sector organisation can be described as a nation's administrative or economic institutions that give services and goods to the citizen on behalf of the state and rely on government budgetary allocations for their funding. According to Campbell et al. (2010), public organisations encounter multiple barriers by policies and government priorities, by political influences and are affected by economic conditions. For example, it is common that many of them often face the issues of political pressure that influence periodic structural changes which can cause periodic disruption in top-level management. This problem sometimes can affect the decision about program priorities and budgeting in the organisations. Furthermore, it could change IT projects and portfolios significantly over the short period, resulting in data discontinuity and lead to IT investment losses (Al Qassimi & Rusu, 2015). These problems and pressures could therefore also apply to MCI and CDII.

Table 2 Differences between Sectors (from Campbell et al., 2017)

Attribute/factor	**Sector**			
	Public		**Private**	
	Public service	Profit	Non-profit	Profit
Goals	Multiple and intangible	Multiple and tangible	Multiple	Specific and tangible
Product	Provide services and public goods	Sell services	Provide services	Profit
Achievement measured by	Political efficiency & achieving policy mission	Sustainability of service provision	Achieving mission	Financial profitability and efficiency
Environmental	Less incentives for productivity	May have more incentives than government	No incentives, use volunteers	More incentives
	More legal and formal constraints-red tape	Less formal constraints	Less red tape	Less red tape
	Political influences	Some political and market influences	Free of influences	Market influences
Proprietary versus shared IT	Shares IT resources,	IT is proprietary to give an edge	Lack of sharing resources	Treats IT as proprietary to

	applications and technical help			stay ahead and competitive

To promote accountability of IT projects and contribute to an effective IT Governance implementation in the organisation, both public and private sectors should implement the integration of structure, processes, and relational mechanism for their IT Governance (Al Qassimi & Rusu, 2015). However, researchers stated that the differences between both sectors might require different principles in the management and governance of organisational information systems (Bozeman & Bretschneider, 1986; Al Qassimi & Rusu, 2015). According to Hoch & Payan (2008), to establish good IT governance in the public sector, they need to consider five values driving dimensions, namely 1) Leadership mandate that addresses the authority accorded to the IT leader role in the organisation, 2) Organisational structure that focuses on the structural factors of the IT organisation to provide a balance, 3) Decision-making process which describes the method of identification of IT demands and its prioritisation, 4) Mindsets and skills is the capabilities and skills needed to carry out the IT management, and lastly 5) Performance metrics and incentives are the measurements that need to be defined in order to assess performance.

2.4 IT Governance Framework

A lot of IT governance frameworks are introduced for the past two decades to accommodate the IT industry to better manage performance, quality, and reliability of IT in organisations. It also develops to respond to regulation and contractual requirements like Sarbanes and Oxley act. Companies can choose between developing their framework based on best practices and experiences found within the companies or adopting and adapting the best practices framework that is available in the market to their organisations. Adopting the defined IT Governance framework is beneficial because standards have been developed, assessed, and perfected by the combined experience of hundreds of organisations and effort from experts over time. It also provides a suitable structure so that an enterprise can quickly follow and helps everyone to be on the same page. Additionally, it can increase trust from business partners and respect from the regulator and auditor (Spafford, 2003).

Many researchers attempt to propose various IT Governance models and concepts, such as Van Grembergen and De Haes (2004), Weill and Ross (2004), Brown and Grant (2007). From practitioner, there are various versions of IT Governance frameworks and standards that are becoming widely adopted around the world such as ISO/IEC Standard 38500: Information technology - Governance of IT for the organisation, CMMI, ITIL, and COBIT. Given these various choices, comes the dilemma of deciding the one for the project. Since each of frameworks has its strengths and advantages, some of them even complement each other and maybe have overlapping functions (Looso et al., 2010) making it harder to decide.

Particularly in Indonesia, by using grounded theory from Wolfswinkel et al. as described in "Literature study" section, there are 44 relevant studies to this project as shown in Appendix 2 with the most recent publications are from 2016. We cannot find recent similar project that publish after 2016. Thus, it could be limitation for our literature review's work. Figure 5 presents the distribution of frameworks that use by the researchers. It appears that the most frequent framework is COBIT in various version, either mix with other framework or standalone, indicating that many researchers in Indonesia are familiar with this guideline. Among them, COBIT 4.1 is the most popular version for research about IT governance in public sector in Indonesia with percentage 31.8 % and the second place is COBIT 5, that was only introduced in 2012, with 29.5%.

The data gives insight about where to start our examination to find a suitable framework for CDII. Further, as mentioned earlier in "Related work" section, there is similar research to redesign IT

department structure in local government in Indonesia. For their project, Ghozali & Shodiq (2012) choose COBIT 4.1 as their framework. The result showed that IT processes in COBIT could be mapped into organisational structure to be in line with business goals. However, COBIT 4.1 only provides inputs and outputs for process level, whereas COBIT 5 provides these for each management practices, making it detail guidance for designing processes which contain important work products and to support with inter-process integration (ISACA, 2012).

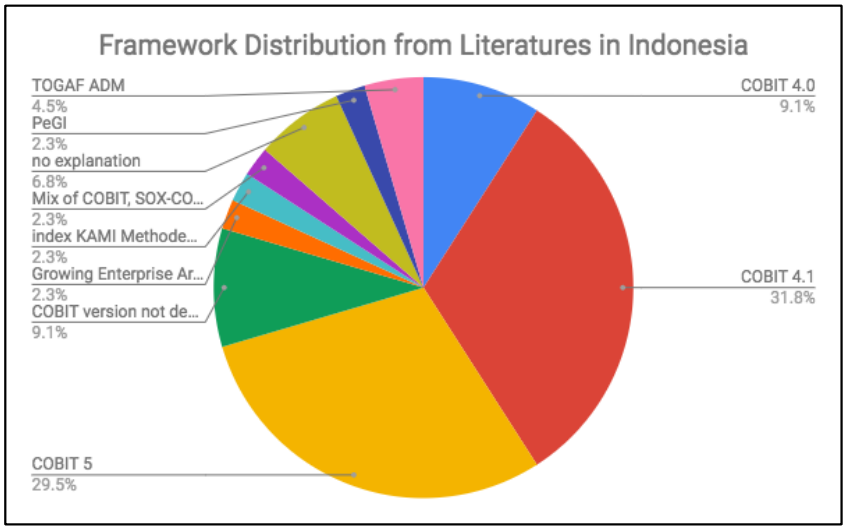

Figure 5. Framework Distribution from Literatures in Indonesia

As for CDII project, since it was highlighted by the employee that they want to cover end-to-end IT business processes in organisation, thus COBIT 5 can give better result in listing what they have already done right now and what they should improve for next comprehensively. Additionally, ISACA revised goals cascade based on enterprise goals driving IT-related goals and then supported by critical processes, so It was no longer a simple enabler like in COBIT 4.1. The goal cascade in COBIT 5 has turned into the source of sustainable competitive advantages for enterprise (ISACA, 2012). This advantage aligns with the objectives of the master thesis project in which to redesign IT organisational by strategic design in order to improve ministry's competitive advantages. Moreover, based on discussion with CDII's employee, they stated that many of them are familiar with this framework. These reasons could justify our choice to consider COBIT framework as guidance for the master thesis project.

The scientific reviews advocating the use of COBIT to govern IT also examine thoroughly. It was found that COBIT has widespread adoption, both in the public and private sector, reinforce its acceptance and credibility. COBIT has been recognised as the most used and a complete framework with a holistic view of all IT processes in the enterprise to meet performance and compliance requirement (Weill & Vitale, 2002; Looso et al., 2010). De Haes and Van Grembergen (2004) view that COBIT as high-level control objectives is presumed as being process focussed that can be implemented using ITIL which is a service-oriented standard. To put it simply, according to them COBIT explains what to do, and ITIL defines how to do it.

Moreover, ISACA (2012) declared that the latest version of COBIT 5 is a robust IT Governance framework that provides the advantages that any company is searching for, for instances: help organisation to keep high-quality information to support business decisions, to realise strategic goals and business benefits through the effective and innovative use of IT in company, to deliver operational excellence through reliable, efficient application of technology, and to manage IT-related risk. Following this review, we decided to use COBIT 5 as a framework for our research because the structure was likely best suit our requirements. And since COBIT 5 is complicated and broad, the next thing to

do is exploring inside of this framework to define a set of plans for our study. The explanation can be found in the following chapter.

3 COBIT 5 Framework

This chapter describes a state of the art several aspects of the COBIT 5 framework, such as its principles and processes and later the strategy for this research will be explained.

3.1 COBIT 5 Overview

One of the well-known frameworks for IT Governance is COBIT (Control Objectives for Information-related Technology) by the IT Governance Institute (ITGI) and Information Systems Audit and Control Association (ISACA). COBIT is a framework based on best practices, and it focuses on the processes of the IT organisation and how their performance can be assessed and monitored (ITGI 2005). It can be used at the highest level of IT governance, providing an overall control framework based on an IT process model that is intended by ITGI to match and useful with every enterprise generically.

COBIT first issued in 1996, intended for audit-related activities, while in the newest version COBIT 5, released in 2012, provides a comprehensive framework that assists enterprises to achieve their objectives for the governance and management of enterprise IT. According to ISACA, COBIT 5 enables IT to be governed and managed holistically for the whole enterprise, taking in the full end-to-end business and IT functional areas of responsibility, considering the IT-related interests of internal and external stakeholders (ISACA 2012). Additionally, it helps companies to create optimal IT value by maintaining a balance between realising benefits, optimising the level of risk, and using resources. COBIT 5 combines the knowledge that dispersed from the previous three ISACA frameworks: COBIT, Val IT, and Risk IT (ISACA 2012; ITGI 2005) as shown in Figure 6. Because of its high-level abstraction and broad coverage, COBIT is often referred to as the 'integrator', bringing various disparate practices under one umbrella and helping to link these various IT practices to business requirements (Saull & Van Grembergen, 2001).

The most significant area of change from COBIT 4.1 to COBIT 5 is the reorganisation of from being an IT process model framework into an IT governance framework. ISACA has been improving COBIT 5 with a set of governance practices for IT, a management system for the continuous improvement of IT activities and a process model with baseline practices (ISACA, 2012).

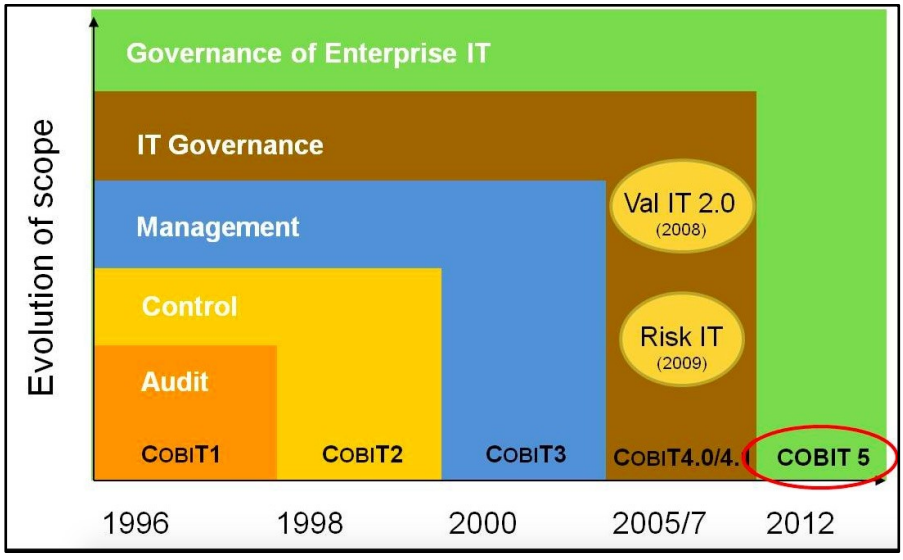

Figure 6. Evolution of Scope COBIT Framework (from ISACA, 2012)

The changes in COBIT 5 has rationalised the existing processes in COBIT 4.1 with combining, assigning and adding practices for the management and governance IT, thus will require IT managers

to improve attitude to how they plan, organise, direct and control resources and deliver the performance required. COBIT 5 also emphasizes on the goals cascade, though it was not a new term in COBIT, it has revised and updated for the latest release. ISACA made it a prominent early in guidance because it is fundamental for organisation leaders to understand their business requirements for information systems (ISACA, 2012). The following described the major changes in COBIT 5 according ISACA (2012):

- New 5 GEIT (governance of IT) Principles
- Increased Focus on 7 Enablers
- New Process Reference Model are added, from initial 34 to 37 processes. For two areas, governance includes 5 processes and management has 32 processes
- New and Modified Processes which reorganize the description on individual process and activities for each practice
- Practices and Activities: there are 210 practices in total, 15 in governance area and 195 for management, including 1111 activities
- Goals and Metrics: COBIT 5 provides examples based on goal cascades
- Inputs and Outputs: COBIT 5 provides detailed guidance for every management practice
- RACI Charts: COBIT 5 gives more complete and clearer range of IT roles
- Process Capability Maturity Models and Assessments: the program approach considered to be more robust, reliable, and repeatable

3.2 COBIT 5 Principles

COBIT 5 is revolve around five principles as shown in Figure 7 (ISACA, 2012). The explanation for each principle is presented based on COBIT 5 Framework can be found below:

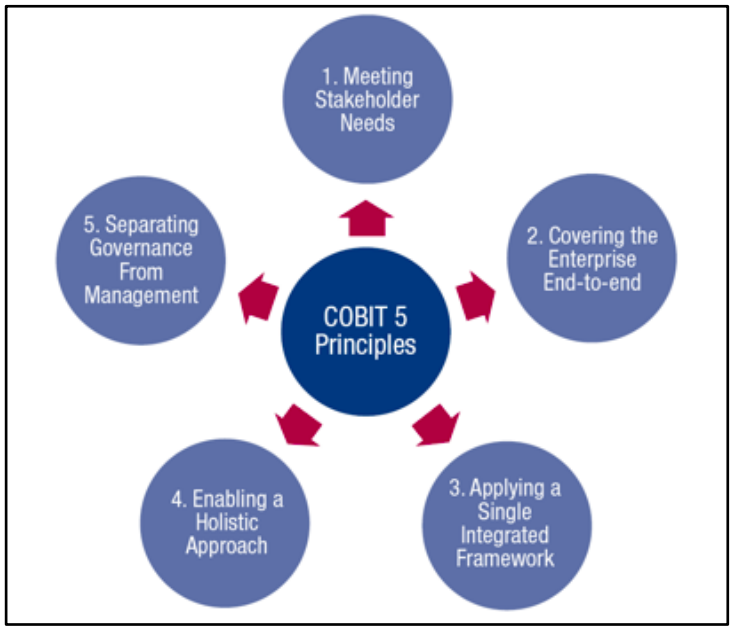

Figure 7. COBIT 5 Principles (from ISACA, 2012)

Principle 1: Meeting Stakeholder Needs

The common goal of enterprise is to give values to their stakeholders. They also need to retain a stability between benefits realisation as well as risk and resource optimisation as present in Figure 8. To cover this problem, COBIT 5 can give the required activities or processes along with its enablers to support

the governance objective to create value for stakeholders. Giving the fact that every organisation has its own unique goals, COBIT 5 can give the customisation using goals cascade to manage general goal into IT-related goal to determine processes and practices needed as shown in Figure 9.

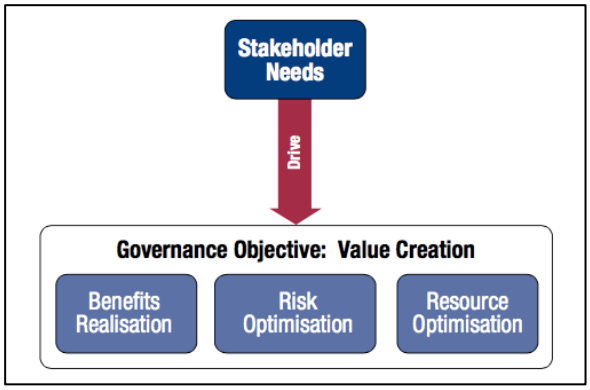

Figure 8. Value Creation (from ISACA, 2012)

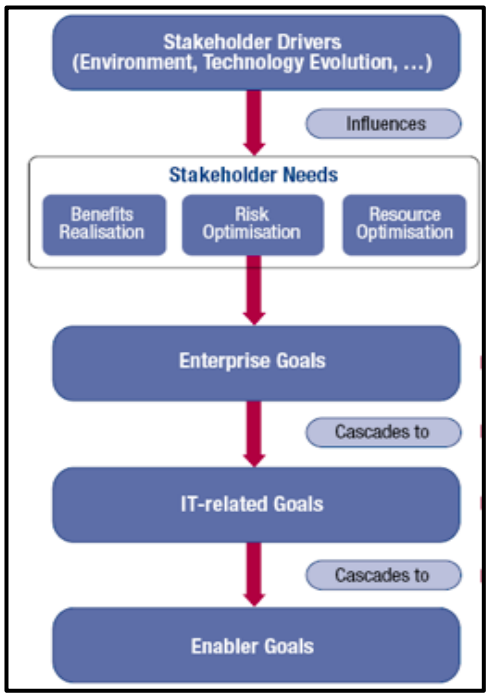

Figure 9. COBIT 5 Goal Cascade Overview (from ISACA, 2012)

Principle 2: Covering the Enterprise End-to-end

The second important fundamental for COBIT 5 is to integrates governance of enterprise IT (GEIT) into enterprise governance by covering all functions and processes in enterprise. Another important message is that COBIT 5 is also focus on information and technologies (assets) that has to deal by enterprise. It doesn't only emphasis on the "IT function". Finally, COBIT 5 believes that all IT-related governance and management enablers need to be enterprise-wide and end-to-end.

Principle 3: Applying a Single, Integrated Framework

By mean of this principle is that COBIT 5 can align other standards and frameworks so that it provides high level explanation and can work as the central framework for governance and management of enterprise IT.

Principle 4: Enabling a Holistic Approach

When we talk about a holistic approach, efficient and effective governance and management of enterprise IT are the necessity to achieve the condition. In COBIT 5, enablers can be described as whatever that can support the enterprise to reach their goals. We identify a set of enablers to help the implementation of governance and management of enterprise IT in order to be comprehensive and COBIT differences enablers into 7, namely: (1) Principles, Policies and Frameworks, (2) Processes, (3) Organisational Structures, (4) Culture, Ethics and Behaviour, (5) Information, (6) Services, Infrastructure and Applications and (7) People, Skills and Competencies.

Principle 5: Separating Governance from Management
COBIT 5 clarify that 2 terms need to be treated differently because both of them has different types of activities, need distinguish organisational structures and try to achieve different objectives. In COBIT 5 framework, governance consider ensuring stakeholder needs, define balance between conditions and options to be agreed upon the enterprise purpose, determine priority, decision making, monitor and evaluate performance and comply with direction and goals of organisation. On the other hand, management of enterprise IT need to plan, build, run and monitor IT related activities to succeed the enterprise objectives that agreed on with the governance committee.

3.3 COBIT 5 Process Reference Model

To implement governance and management processes within the enterprise, COBIT 5 provide key areas as presented in Figure 10. The term that they are using is the process references model that represents the common processes and activities of IT governance and management in enterprise. According to ISACA (2012), the process reference model provides a complete and comprehensive activities. However, each organisation needs to set their own process based on their own situation and condition. The COBIT 5 process reference model distributes the governance and management processes of enterprise IT into two categories process domains as shown in Figure 10. First, governance that comprises three governance processes, evaluate, direct and monitor. Second, management includes four domains, plan, build, run and monitor (PBRM) to keeps end-to-end treatment of IT. The phrase to described them in COBIT 5 is Align, Plan and Organise (APO), Build, Acquire and Implement (BAI), Deliver, Service and Support (DSS), and Monitor, Evaluate and Assess (MEA). Figure 11 displayed the complete set of 37 governance and management processes within COBIT 5 are shown.

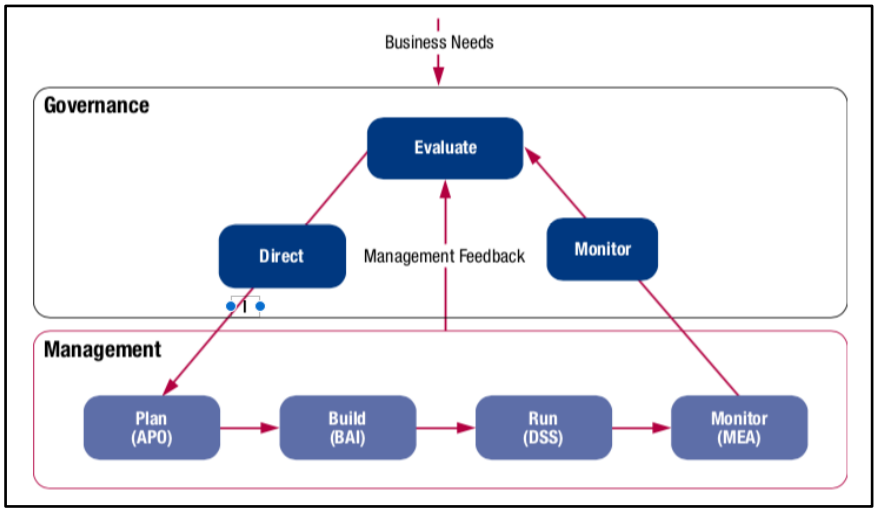

Figure 10. COBIT 5 Governance and Management Key Areas (from ISACA, 2012)

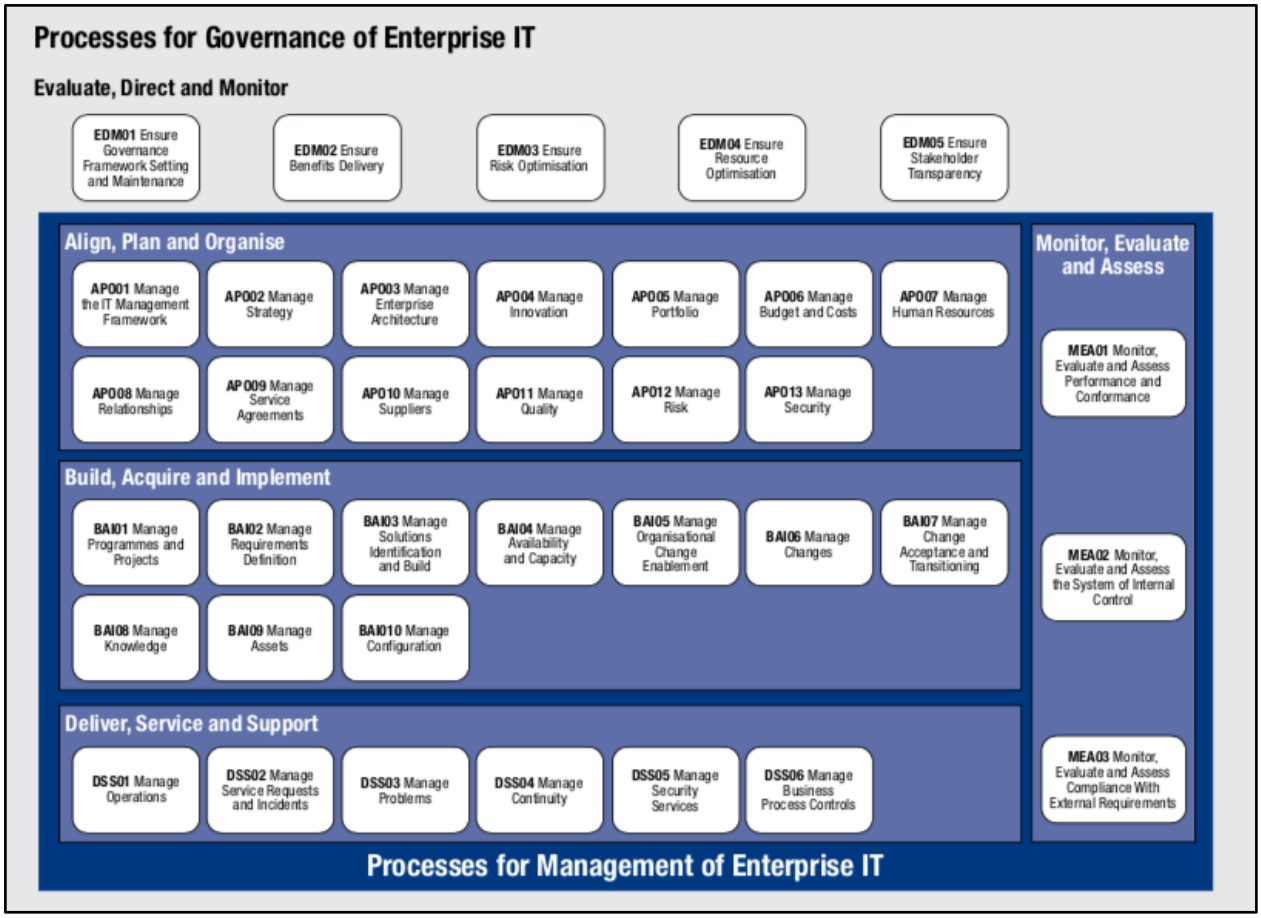

Figure 11. COBIT 5 Process Reference Model (from ISACA, 2012)

3.4 Strategy to Design IT Department Structure

In this section, a detailed approach for master thesis project is explained. The organisational structure of IT Department is actually a design that comes from a systematic thinking process using facts, standards and experiences. This design process will begin by collecting a number of facts and make strategic decisions about how the IT department wants to carry out its services, processes and activities.

COBIT 5 brings together five principles that enable companies to build effective governance and management based on a holistic set of seven enablers that optimizes investment and the use of IT to provide benefits to stakeholders. Based on ISACA (2012), COBIT 5 is not prescriptive, but it advocates organisations to implement corporate governance and management processes, such as key areas that can be seen in Figure 10. The process of evaluating, directing and monitoring in the governance domain includes practices and activities that aim to evaluate strategic choices and to provide IT goals as well as to monitor the results. The governance domain ensures that the needs and desires of stakeholders, conditions and choices are evaluated to determine the balance and in accordance with the objectives of the organisation that want to achieve. In addition, it establishes direction through priority and decision making, and monitor performance and compliance with the approval of directions and objectives. This relates to the objectives of stakeholder value creation in which providing benefits, optimizing the level of risk, and optimizing the use of resources as illustrated in Figure 8.

The plan, build, operational (Run) and monitor in the management domain is in line with a set of directions from the governance domain in which to achieve company goals. Activities in the Align, Plan and Organize (APO) areas can give directions for activities in the domain Build, Acquire and Implement (BAI) and domain Deliver, Service and Support (DSS). Domain Build, Acquire and

Implement provides solutions that are then passed on to services, as directed from the Align, Plan and Organize domains. In addition, Domain Deliver, Service and Support can get the directions from the domains Align, Plan and Organise. Moreover, it also receives solutions from the domain Build, Acquire and Implement to make the solution and to users.

Domain Monitor, Evaluate and Assess (Monitor) conducts regular assessments of the company's IT services to determine the quality and compliance of services with requirements. It includes service performance management, service internal controls and service compliance with external regulations. The results of these activities become input evaluation (feedback) for leaders in the governance domain (evaluate, direct and monitor).

Based on the explanation above, there is an interaction between domain of governance and management. This interaction, as can be seen in Figure 10, it also shows that IT lifecycle which includes end-to-end processes is related to IT planning (plan), development / build (build), operational (run) and monitor at the technical level of management (management area); and evaluate (evaluate), direct (direct) and monitor from strategic leadership level (governance area).

The IT lifecycle model based on the domains in COBIT 5 can be used to formulate a model of the IT organisational structure because of the completeness of IT processes that should be carried out by IT organisation. Furthermore, the structure also needs Supporting function to complement operational activities in the organisation. A model based on this description can be seen in Figure 12. Governance area is the focusing on leadership and relationship with stakeholders whose roles is to give guidance as well as to monitor and evaluate on the implementation of IT and provide approval and support for the implementation of IT governance related to IT policies and standards, and IT strategic plans and initiatives. The management area is a technical area for implementing IT related activities in the organisation including planning, development, operational, and monitoring activities of IT services. The implementation and management of these activities will be led by Chief Information Officer. The supporting part contains with general non-technical and non-IT related activities that support the implementation of activities in the governance and management area.

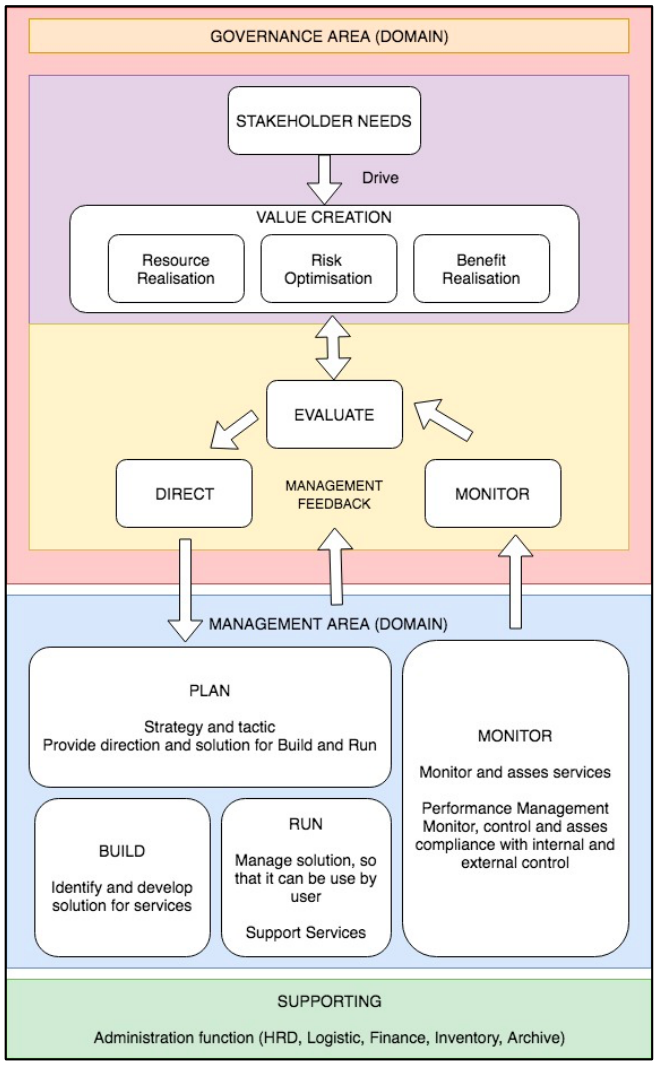

Figure 12. Model for IT Department Structure

In order to find out the current situation and future intention, semi-structured interview question is constructed in Appendix 3 based on the above explanation. Then we define current IT processes using COBIT cascade goal guideline to map IT process reference model with current activities and services in organisation. The result can contribute to obtain information about what processes that lack from existing condition. Beside interview, observation and document review are also used to conduct the assessment. Figure 13 illustrated planning of COBIT 5 implementation for this research. This is a complete assessment process taken straight from the book, though in real condition the assessment could vary based on case study's circumstances and settings. Best practices framework should adopt and adapt to tailor with organisation in order to succeed.

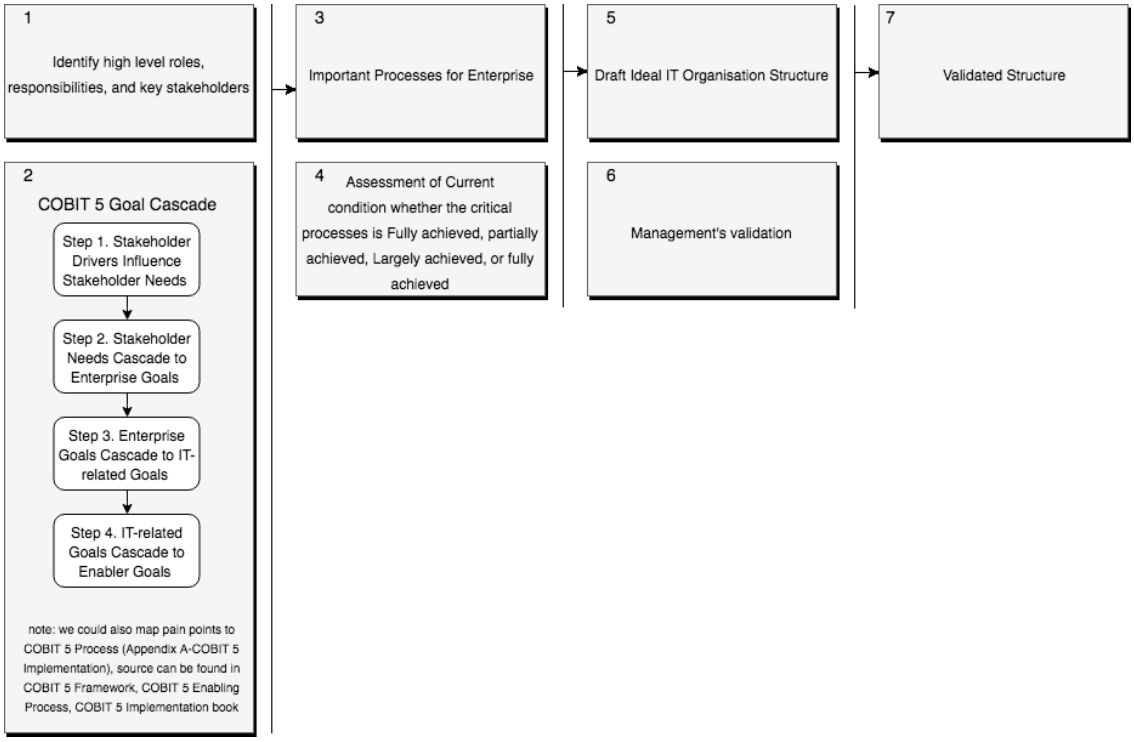

Figure 13. Assessment Plan using COBIT 5

In the next phase, the result from analysis will be the tool to determine CDII current conditions (as-is condition) and to produce the proposed CDII organisational structure (future condition). Next chapter will present the result from assessment in order to give clear insight of case study setting to the reader.

4 Current Condition

In this chapter, the explanation about case study situation in IT organisation based on interviews, observations, and document reviews are presented to give the reader understanding.

4.1 Organisation Profile

Ministry of Communication and Informatics is a ministry of the government of Indonesia which responsible for communication and information affairs in the state and as part of the cabinet that assist the president. Based on ministerial regulation No. 1 of 2016 about MCI's organisational structure and work procedure, the Ministry is organised into seven directorates as echelon I. Every echelon I consist of several echelon II unit. Centre for Data and Informatics Infrastructure (CDII) is an echelon II unit under the Secretariat general.

CDII position in the organisational structure of the MCI, as displays in Figure 14, shows the relationship between CDII to the Minister and Echelon I (Secretariat General). It can be seen that CDII has two lines of connections within the formation, namely a clear line to the Minister and a dashed line to the Secretariat General. The clear line shows that although CDII is an Echelon II organisational unit under the Secretariat General, CDII has a responsibility to manage IT in whole work units under MCI, not only limited to the work units under Secretariat General. Furthermore, CDII is also directly responsible to the highest leader of the MCI, which is the Minister. As for the dashed line, it shows that CDII is responsible to the Secretary-General in administrative matters.

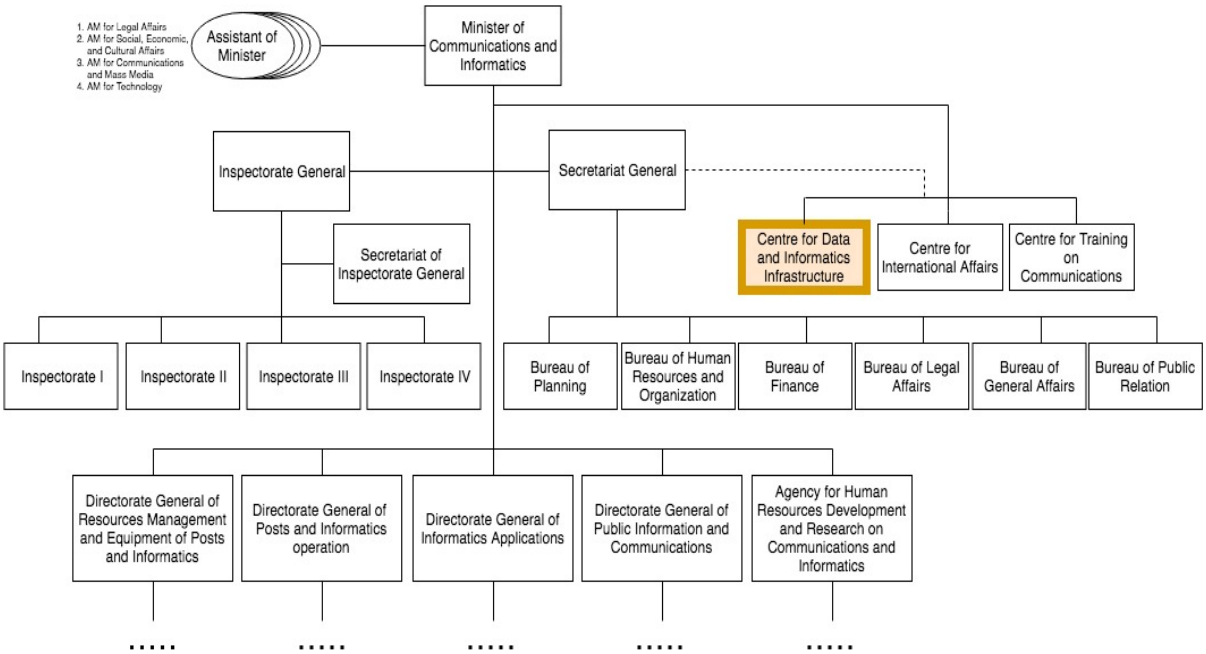

Figure 14. MCI Organisational structure (From ministerial regulation No. 1 of 2016)

CDII has two Division namely, Informatics Infrastructure Division and System Data Division as shown in Figure 15. Informatics Infrastructure Division's duty is to implement, monitor and evaluate work related to informatics infrastructure in which IT network system and Information Security, as well as electronic procurement services and its maintenance. While the System Data Division mainly focuses on implementing, monitor and evaluating the technical policy for portal management, data processing, and application development.

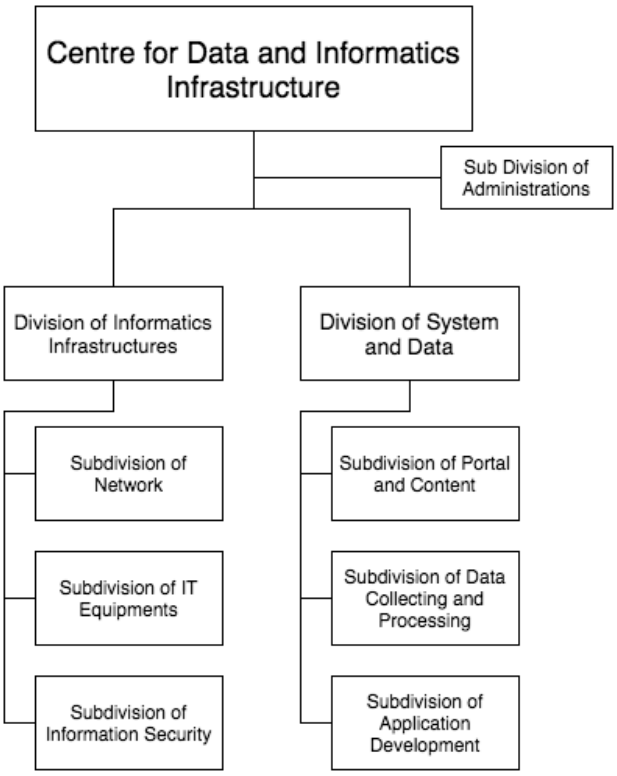

Figure 15. CDII Organisational structure (From ministerial regulation No. 1 of 2016)

Each division consists of three subdivision allowing distribution of work, a more comprehensive explanation about CDII unit and its obligation can be found in ministerial regulation No. 1 of 2016 that translated in Appendix 4.

The fact that MCI has a long history of merger and demerger with different government agencies and departments, indeed affecting the organisation's structure over the time. In 2009, the president decided to integrate the Department of Communication and Information, the National Information Institute, and the Directorate General of Post and Telecommunications from the Ministry of Transportation with the addition of a new directorate, which is the Directorate General of Telematics Applications. This combination formed today MCI (Kominfo, 2018). Indeed, during that time, the organisational structure of the CDII has completely changed. It was initially a merger of the two previous work units, namely the Data Centre and the Centre for Telematics Engineering Facilities.

According to interviewer, the current structure of CDII right now is considered only created to meet the needs of the day and not by strategic design. Also, the ideal organisational structure that they desire is supposed to have divisions and sub-divisions that responsible to all of IT processes to maintain, develop, and monitor the information flow and technologies from end-to-end according to their business strategy. As with the current structure, it has not satisfied their intention. Hence, CDII plans to restructure the IT organisational design to be optimised and align with their business strategy. Redesigning IT organisational structure can be highly disruptive, emotional, and politically charged. Thus, active reorganisation efforts need to start by identifying the future direction, defining a future operating model, and making decisions about how to deliver IT services in the future. It also aims to increase efficiency and reduce overlapping tasks.

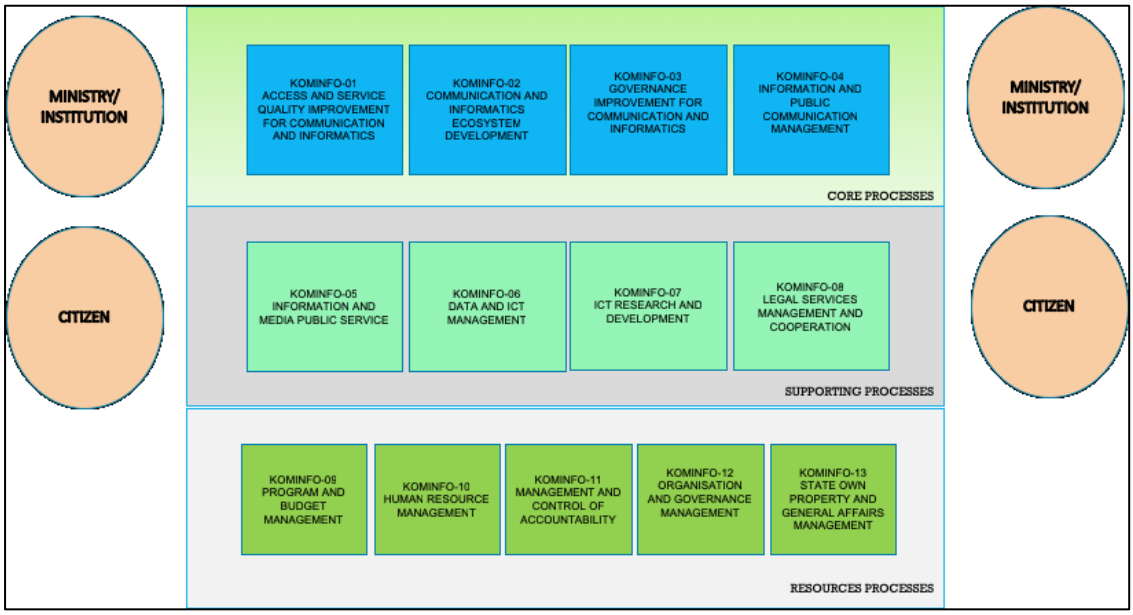

Figure 16. Process Business (From Secretary General MCI Guideline Number 3 of 2017)

Based on the Secretary General MCI Guidelines Number 3 of 2017, the ministry has 13 business processes consisting of 4 Core Business Processes, four Supporting Business Processes and five Business Process Resources, as displayed in Figure 16. Among all the processes, CDII has duties to carry out business process KOMINFO-06 about Data and ICT management in organisation.

IT management in organisation has decentralised IT team structure. Directorates can inquire IT budget as part of their annual program then manage their own project and do the infrastructure provision without coordinate with CDII. Though, there are also many work units that still collaborate with CDII regarding their IT project depend on situation. Their scope is for particular application for example telecommunication permit system, radio frequency spectrum permit system, etc that related to their specific business process while for internal information system such as HR, finance, procurement application, e-office etc will be handled by CDII.

4.1.1 Human Resources

Based on data from the Bureau of Human Resources and organisation at the Ministry, there are 3,435 employees throughout all work units in 34 provinces. The composition based on the highest number of employees is in the Directorate General of Resources Management and Equipment of Post and Informatics with 1,358 people spread in 35 locations in Indonesia that the provision of infrastructure is carried out directly by the Directorate.

Based on age range, many employees at the Ministry are almost at retirement age, in which 1,217 people. This occurred because of the merger and moratorium happened five years ago following the priority program from previous president. For age range 31 to 40 it is quite high at 1,114 while the ages of 20 to 30 are 320 people. Human Resources in CDII consist of 22 civil servants (one head of CDII, two head of divisions, six head of sub divisions, four functional officials of computer administration, and 13 general functional staff) and 13 outsource employees (five IT staff and eight non-IT staff). The shortage of IT professionals to fulfil user needs and expectations in CDII is undeniable. Especially resources and HR regulations right now create limits for 24 hours seven days services support.

4.1.2 IT Services

Based on document reviews, observation and interviews, IT services that manage by CDII can be classified in the following:

1) implementation of internal information system
2) implementation of data warehouse
3) implementation of data integration and exchange services between government agencies (Government Service Bus)
4) management of domains and subdomains kominfo.go.id and e-mail with the domain kominfo.go.id
5) provision of cloud computing including Virtual Private Servers and knowledge management system
6) management of IT service desk
7) management of the Ministry's official social media channel
8) providing Live Streaming services, Video Conference services, access to virtual private networks
9) Information Security Management services; and Electronic Procurement Services
10) consolidation of master data, standardization of data, data collection, processing, and analysis as well data presentation

4.1.3 Application and Infrastructure

In total there 95 applications listed in ministry as presents in Table 3. However, not all of these applications are maintained by CDII. As mentioned before, that IT management in ministry right now is decentralised between CDII and directorates. In addition, employees also have to use application from other ministries.

Table 3 Number of Application in MCI

Classification of Application	Number of Application
Administration and General Management	14
Legal Administration	1
HR Management	6
Finance Management	16
Project Management	0
Public Service	38
Website	20
TOTAL	95

It can be found several common problems in the implementation of Information system in the Ministry, namely:

1. There are duplicate applications (some applications have same functions). Duplication of the system can be seen in the administration and general management application. It takes a lot of investment in developing and maintaining the operations of each of these applications. There needs to be a policy related to the development and management of applications so that there are no duplications that lead to budget waste. Ideally there is only one application that can be used together and managed by one authorized party, in this case CDII.
2. The lack of compatibility and interoperability between systems so that each system cannot use each other's data or information. For example, financial applications that are currently use mostly from the Ministry of Finance. However, there is no mechanism that enables these systems to collaborate

with each other so that they can produce more comprehensive and valid financial information and reports. Ideally these systems must refer to the same data source so that any data changes only need to be accommodated in one system. In addition, interoperability between systems is also expected to be able to integrate from planning process until the monitoring evaluation of budget realization.

3. The public service system organised by each work unit has not been integrated. Ideally, integrated public service system such as one stop service system can make it easier for citizen to obtain various services in the Ministry. In addition, integrated service systems are also expected to improve the efficiency of process time.
4. Another disadvantage is that the current information system is not responsive and transparent in responding to citizen's aspirations and complaints. In addition, currently each work unit has its own complaints service.

As for Infrastructure, CDII data centre is located in Headquarter in Jakarta with 2 Disaster Recovery Centres to ensure the sustainability of public services in another city in Indonesia, namely Sentul and Denpasar. IT facilities are provided according to internationally recognized standards taking into account security, reliability, comfort and efficiency of devices and technology. Since 2015 CDII has received ISO 27001: 2013 certificate with the scope of the data centre in headquarter and data recovery centre. Another server room operates and maintains by Directorate General of Resources Management and Equipment of Post and Informatics, located also in Jakarta dedicated for telecommunication and frequency permit system with offsite backup in Bandung.

4.1.4 IT Governance

The Ministry has been strengthened with two regulations supporting the implementation of IT governance in the Ministry of Communication and Information, namely Ministerial Decree Number 1155 of 2015 concerning the Establishment of the Information Technology Committee of the Ministry of Communication and Information, and Ministerial Decree Number 1156 of 2015 concerning Determination of Officials Information Technology Manager of the Ministry of Communication and Information Technology. In addition, the newest Secretary General Guidelines of the Ministry of Communication and Information number 1 of 2018 concerning IT Governance, the Ministry of Communication and Information Technology has been authorized. It stated that IT planning and management within the Ministry of Communication and Information Technology will be held centrally by CDII which included:

a. updating of the IT Master Plan of the Ministry;
b. submission of draft policies and provisions related to the IT of the Ministry to the Minister through the Secretary General;
c. alignment of strategic planning and implementation of IT architecture development;
d. identifying, compiling and proposing a strategic IT investment plan at the Ministry;
e. monitoring and evaluating the implementation of strategic IT investment plans at the Ministry of Communication and Information;
f. management of program implementation and IT related initiatives;
g. preparation and implementation of IT policies, standards and procedures;
h. monitoring the implementation of IT policies, standards and procedures related to the Ministry of Communication and Information;
i. manage the availability of IT resources;
j. implementation of information security governance;
k. monitoring and evaluating operational IT services at the environment of the Ministry;
l. implementation of IT disaster management; and
m. implementation and operation of IT service systems at level of the Ministry;

According to interviewers, there is still a lack of IT awareness, IT is only considered as support and has not been reviewed by its strategic functions. IT planning and organizing IT implementation within the Ministry is also not measurable, IT management and development in work units sometimes still does not follow standard and not yet fully implementing IT risk management. The variety of functions and rapid regulation changes/development in ICT field has resulted in the difficulty in establishing standardized standards for interoperability of data and content so that it can become challenge for cooperation and integration of systems between work units within the Ministry. While lack of control and evaluation of IT project can increase security threat. Additionally, not all information and public services are guaranteed 24 hours availability and the public still has to enter the same data many times for different services.

4.1.5 CDII Process Framework

Recently, in September 2018 CDII establish process framework to organise their jobs better as presented in Figure 17. The first component of this IT framework is the IT Master Plan, which is the most important pillar and is the basis of the future goals. The second component of this IT framework is Regulation. In compliance with regulations, the Regulation component needs to be one that is the basis of the IT processes that are carried out. The third component of this framework is Best Practices. It is included as part of the framework to provide an overview in designing a good IT process that suit with organisation. All activities and processes need to be conducted in effective, efficient, reliable, safe, and compliance manner. As for the inside box is core activities in IT management namely plan, build, deliver, and run. The white boxes are the activities that need to be manage in CDII and must be have person/division in charge. Later we also consider these activities to create the proposed organisational structure for CDII.

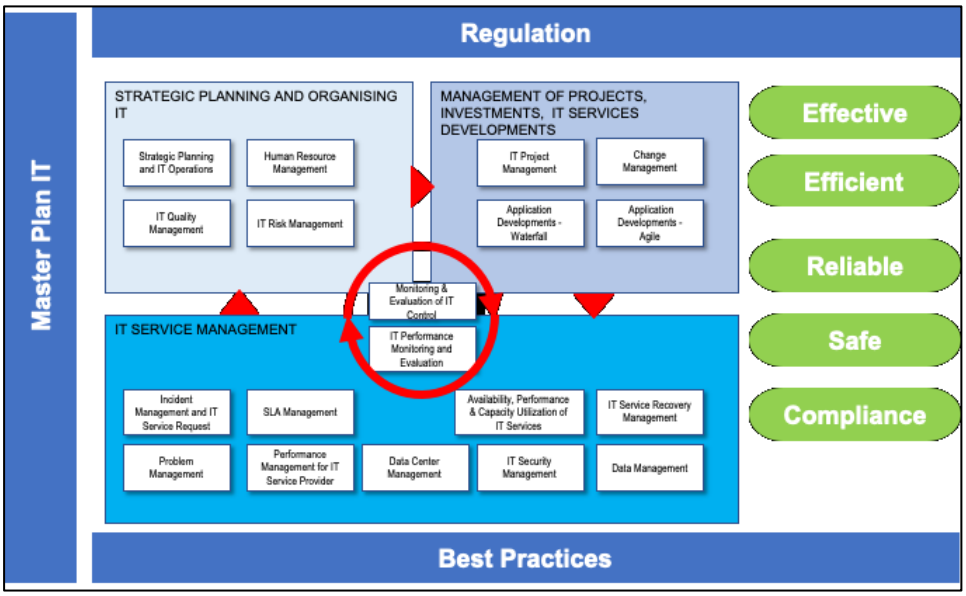

Figure 17. CDII Process Framework

4.2 COBIT 5 Assessment of Current Condition

Each COBIT 5 domain becomes an assessment or mapping tool for the current condition of the CDII organisational structure. The results of the analysis are obtained from the current conditions of the CDII organisational structure which can be used as input for strategic decisions regarding how the CDII organisational structure should be carry out its services and become the basis for redesigning the CDII

organisational structure if needed. Because of time constraints during the research, COBIT 5 stages was simplified according to condition. In COBIT 5, the first thing to do is to scope the domain processes. We decide to skip scope stage part and asses using all 37 domain processes available as the client suggested. The assessment rating indicator for each process also changed because we decide to only use three rating namely if process already fully implemented, partially implanted, and not implemented at all from the original four rating criteria in COBIT 5 (Not achieved, Partially Achieved, Largely Achieved, and Fully Achieved).

The summary of the analysis of the current CDII organisational structure using COBIT 5 domains can be seen in Appendix 5. Results of mapping COBIT 5 domains with the current CDII organisational structure. Based on the results of analysis and mapping of COBIT 5 domains, it can be concluded that:

1. There are no divisions or sub-divisions in the current CDII organisational structure that have the duties and functions to ensure that there is regulation and maintenance of the governance; ensuring benefits; ensuring risk optimization; and ensuring transparency to stakeholders.
2. CDII has not been optimal in implementing quality management system because there are still several processes in IT management that should have been maintain but currently it has not yet been implemented.
3. Divisions or sub-divisions in the CDII organisational structure perform many functions and jobs that are less focus, for example sub-division of application development, beside developing applications must also do other work such as managing operational and support users (become helpdesk). This causes work load to be excessive (overload), consequently the implementation work becomes less focused, less professional, and delays in handling problems.
5. There are no Divisions or sub-divisions in the current CDII organisational structure that supervise the processes/activities undertaken to ensure compliance with policies and regulations.

The results of the analysis and mapping of COBIT 5 domains towards the current organisational structure of CDII and the unfavourable conditions of the current CDII organisational structure indicate that the current CDII organisational structure has not implemented an IT life cycle that includes end-to-end processes for IT such as plan, build, run and monitor management area; and evaluate, direct and monitor at the governance area.

The current CDII organisational structure does not include the completeness of IT processes. Based on the analysis, not all COBIT 5 domains are included in the current CDII organisational structure, from 37 COBIT 5 domain processes, there are only six COBIT 5 domain processes (16%) included in the CDII organisational structure, whether or not the activities in the domain are fully or partially implemented. Figure 18 displays the current condition as regard to current DCII organisational structure to COBIT 5 processes. We can see that six processes that exist in current structure as follows:

1. BAI01 - Manage Programmes and Projects
2. BAI02 - Manage Requirements Definition
3. BAI03 - Manage Solutions Identification and Build
4. BAI04 - Manage Availability and Capacity
5. BAI06 - Manage Changes
6. DSS01 - Manage Operations

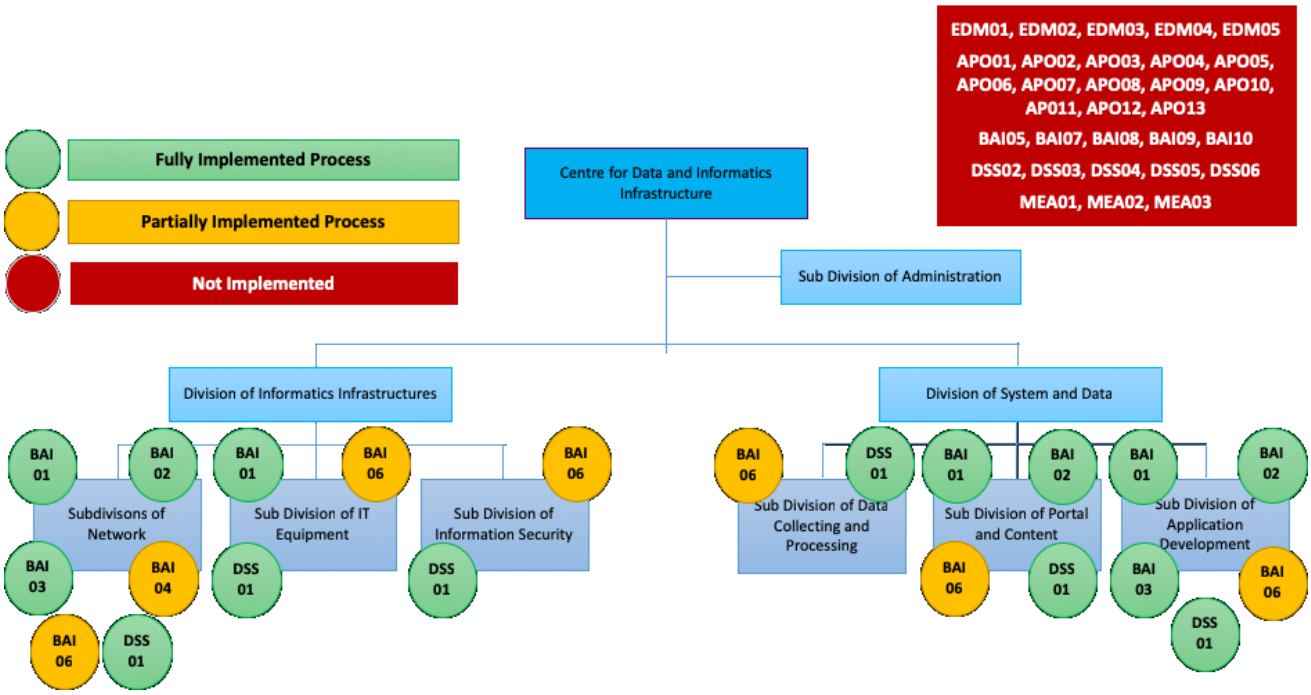

Figure 18. Mapping COBIT 5 Processes to Current Organisational Structure

Taking everything into account, based on analysis of current condition, CDII is still consider lack of grit to carry out IT related work and activities. It is necessary to implement the restructuring of CDII organisational structure in the Ministry since CDII's role is increasingly important after the two regulations supporting the implementation of IT governance in the Ministry of Communication and Information (Ministerial decree Number 1155 of 2015 concerning the Establishment of the Information Technology Committee and ministerial Decree Number 1156 of 2015 concerning the Establishment of CIO in ministry) was issued.

5 Proposed IT Organisational structure

In this part of the report the proposed model for CDII structure is described. Using the information from the previous part, a model is designed which is validated with employee within CDII.

Based on the analysis of the current state of CDII in previous section, in order to improve effectiveness and efficiency of IT implementation in ministry, we need to redesign its structure. The organisational structure reference that we use to create the new CDII organisational structure will includes COBIT 5 domains in two main areas, namely the domain of governance and management domains to cover the IT life cycle (Plan, Build, Run, and Monitor).

Currently, the Ministry of Communication and Information has been established two regulations to support the implementation of IT governance, namely Ministerial Decree Number 1155 of 2015 concerning the about Formation of IT Committee for Ministry of Communication and Informatics, and Ministerial Decree Number 1156 of 2015 concerning Establishment of Officials Information Technology Manager in the Ministry of Communication and Information Technology. The two regulations will be used as the basis for creating the CDII organisational structure architecture.

According to the Ministerial Decree Number 1155 of 2015, members of Information Technology Committee consist of high-level structural officials from Echelon I and assistant of ministers. IT Committee, which is include in the domain of governance area, chaired by the Secretary General. The Head of CDII has role as secretary of the IT Committee, with the expectation that the Head of CDII will always be included in strategic activities such as:

(1) giving direction to the implementation related to IT (IT services, IT resources, IT investment) and perform monitor and evaluate activities of the implementation of IT; and
(2) giving approval and support for the related to IT policies and standards, and IT strategic plans / initiatives.

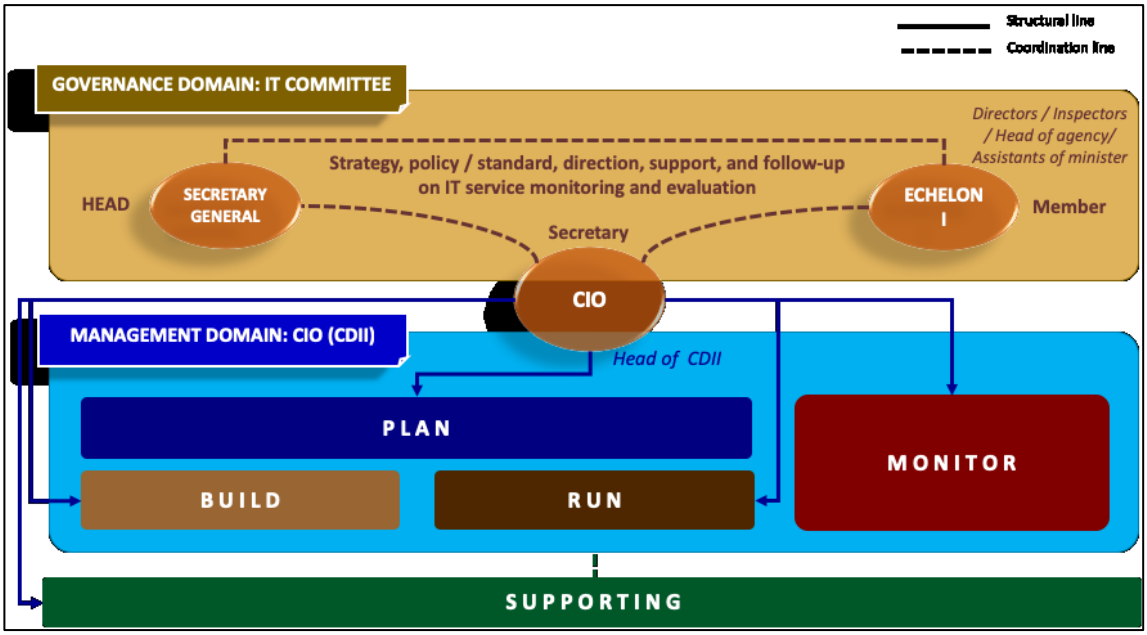

Figure 19. Architecture for Design IT Organisational Structure

In addition, as the secretary of the IT Committee, the Head of CDII as CIO is also a liaison and executor in realising the value creation for stakeholders. Thus, the Head of CDII place in two areas, Governance and Management area. For governance area, he has responsibility to coordinate with the IT Committee

in strategic aspects and for the management domain, he needs to run IT services and activities. Figure 19 summarizes all the above explanations regarding the IT Committee, CIO, and IT activities that has to be carried out by CDII. It presents an CDII organisational structure architecture that will be used as the basis for redesigning the new structure. We also take a look to other ministry namely Ministry of Finance in Indonesia because according to Annual Rating of e-government implementation for local and national government agency in Indonesia, ministry of finance placed first among other national agencies. However, we only review their IT organisational structure through document found in the internet to get insight how each divisions and sub-divisions responsibility to implement IT in their ministry.

5.1 Ideal IT Organisational structure (Three Divisions)

Broadly speaking, the new CDII organisational will need structure that includes four main activities, which carry out IT services based on COBIT 5 domains in following:

1. strategic planning, IT governance and IT policy (plan);
2. designing, building, developing, testing and quality assurance of IT services (build);
3. planning, managing, monitoring and operating IT services request and helpdesk (run); and
4. management of IT service performance (monitor).

In addition, the new CDII organisational structure is also supported by one part outside of the 4 main activities in which it is important to support the main activities. These activities are usually always present within every work unit in ministry. The supporting unit have to organise mail administrations, documents filing, HR administrations, finances, organisation properties, and logistics. Hence, we should provide one subdivision regarding this requirement. To sum up, we need minimum structure to accommodate four main IT-related activities and one supporting unit while designing new structure.

The above requirements will determine the layout of the organisational structure, the direction of communication and the level of structure of the new organisational model. The number of divisions and sub-divisions later could also define employee requirements and job descriptions. Considered that CDII is part of the government organisation in this case state ministry, we found that there is a regulation that need to be followed. According to Ministry of Administrative and Bureaucratic Reform of Indonesia in which they set the guideline and give approval regarding structural changes, there are several basic patterns of the organisational structure. First, based on the regulation a work unit within ministry that operate as “Centre” may only have a maximum of three divisions and one sub-division of supporting unit for administration matters. Second, under each division, “Centre” is only allowed to have a maximum of three sub-divisions as shown in Figure 20. Following this limitation, we have to map the COBIT 5 domain (plan, build, run and monitor) into three divisions and establish one structure for supporting unit. The general layout of the new CDII organisational structure, which has gone through the process considerations and approaches can be seen in Figure 21.

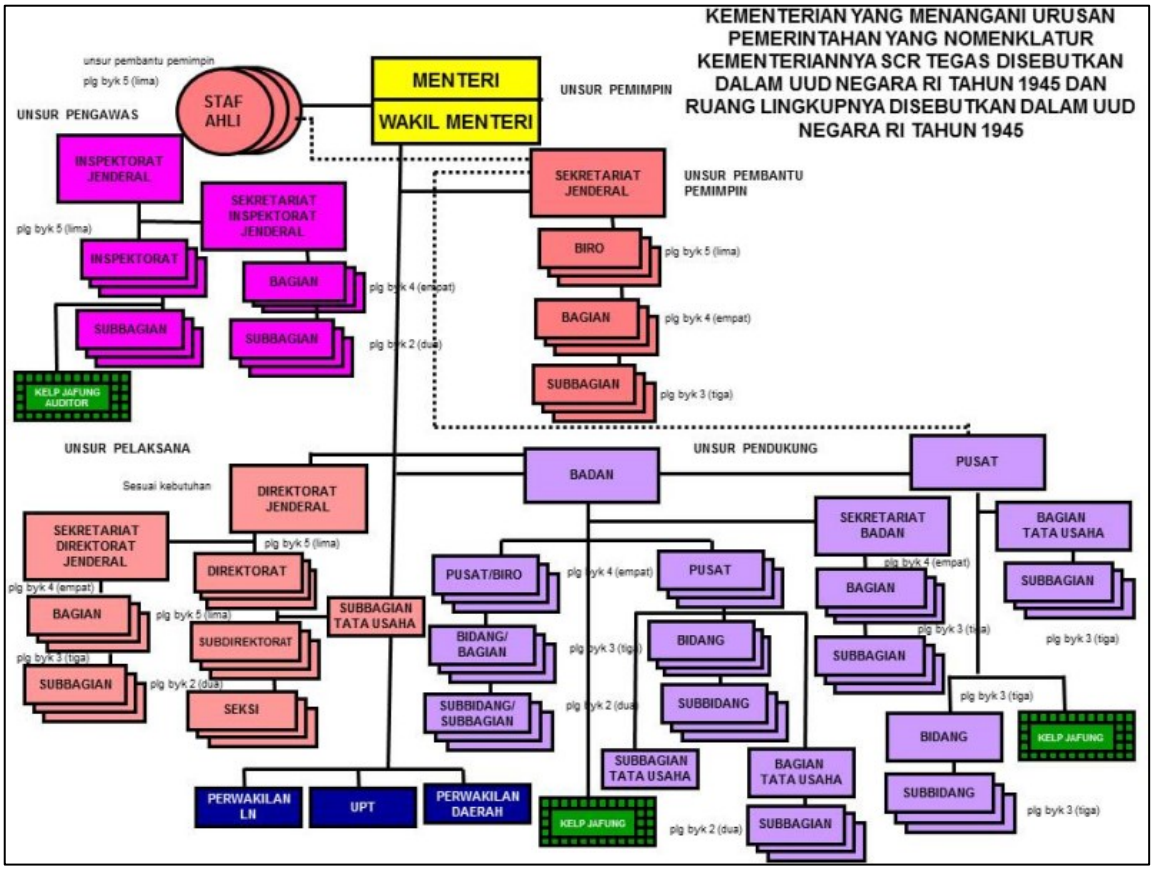

Figure 20. Organisational Pattern for State Ministry (Based Ministry of Administrative and Bureaucratic Reform Indonesia)

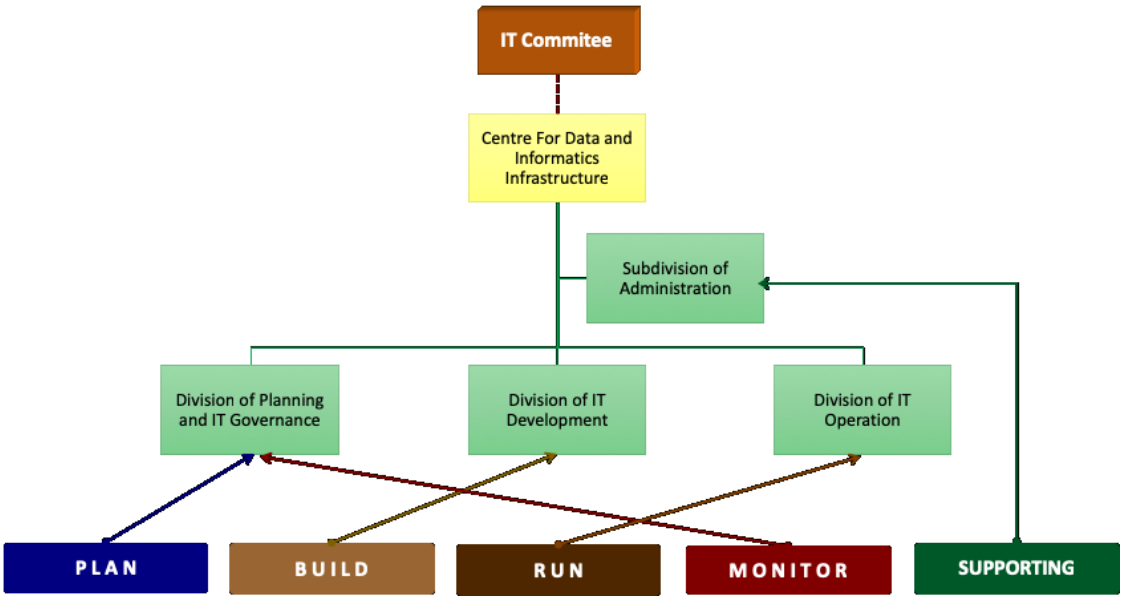

Figure 21. Layout for New Organisational Structure

There are three divisions in the new CDII organisational structure, namely:

1. Division of Planning and IT Governance
   include activities in the domain Align, Plan and Organize (Plan) and the domains Monitor, Evaluate and Asses (Monitor)
2. Division of IT Development
   include activities in the Build domain, Acquire and Implement (Build)

3. Division of IT Operation
   include activities in the domain of Deliver, Service and Support (Run)

The new CDII organisational structure is also equipped with Sub Division of Administration, that will handle the supporting activities. The detailed form of the layout of the new CDII organisational structure, can be seen in Figure 22. The layout used is using a balanced layout approach based on ministerial regulation, which is a layout that fits the democratic management style that is not too broad horizontally and not too deep vertically. The sub-divisions in the layout include details of the activities of the COBIT 5 domains. The divisions and sub-divisions responsibility as follow:

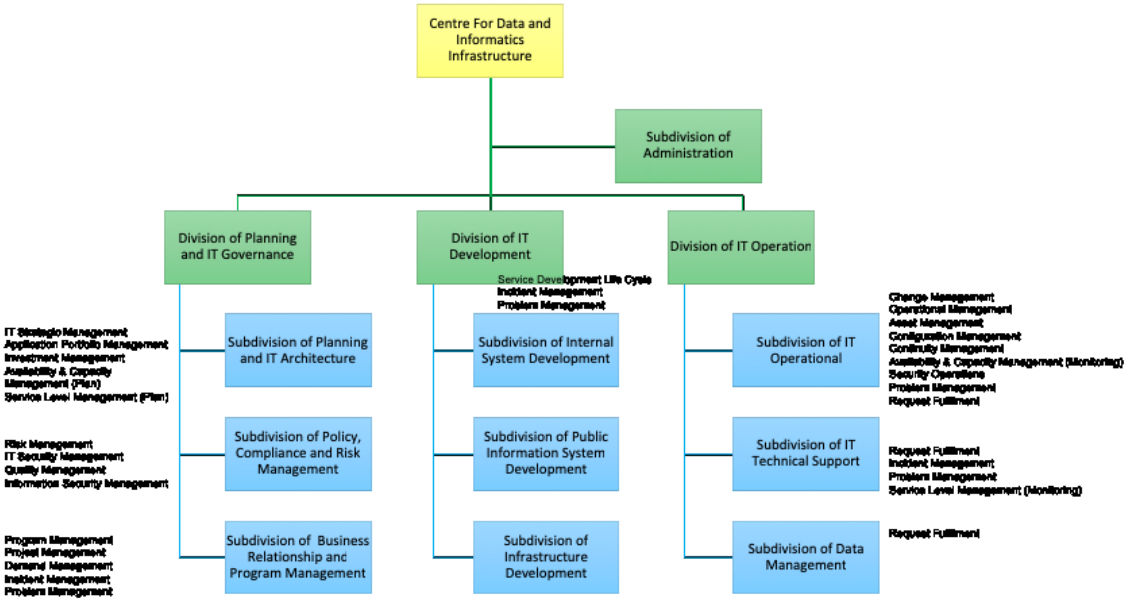

Figure 22. Proposed Organisational Structure (Three Divisions)

- Division of Planning and IT Governance has the responsibility of coordinating the preparation of IT strategic plans, create an ICT roadmap, key performance indicators, IT framework, IT architecture, managing IT service performance, IT programs, and formulating, disseminating, and fostering the implementation of policies and standardization of IT governance and IT risk management to end user. It consists of Sub-Divisions:
  - Planning and IT Architecture
  - Policy, Compliance and Risk Management
  - Business Relationship and Program Management

- Division of IT Development has the responsibility of designing, building, developing, testing and guaranteeing quality of system, databases, networks, and architecture. Consist of Sub-Divisions:
  - Internal System Development
  - Public Information System Development
  - Infrastructure Development

  These sub-divisions include activities such as: Service Development Life Cycle, Incident Management and Problem Management with different scope of work.

- Division of IT Operation has the responsibility of carrying out activities that include planning, managing, monitoring and operating Data Centres, Disaster Recovery Centres, along with all supporting facilities, providing request service of IT and to overcome daily operational problems, and provide information security incident response team. Consist of Sub-Divisions:

- IT Operational
- IT Technical Support
- Data Management

- Sub-division of Administration
  The Sub-division of Administration has the task of providing administrative services conducting the preparation of plans, programs, and budgets, manage administrative affairs, household and human resources.

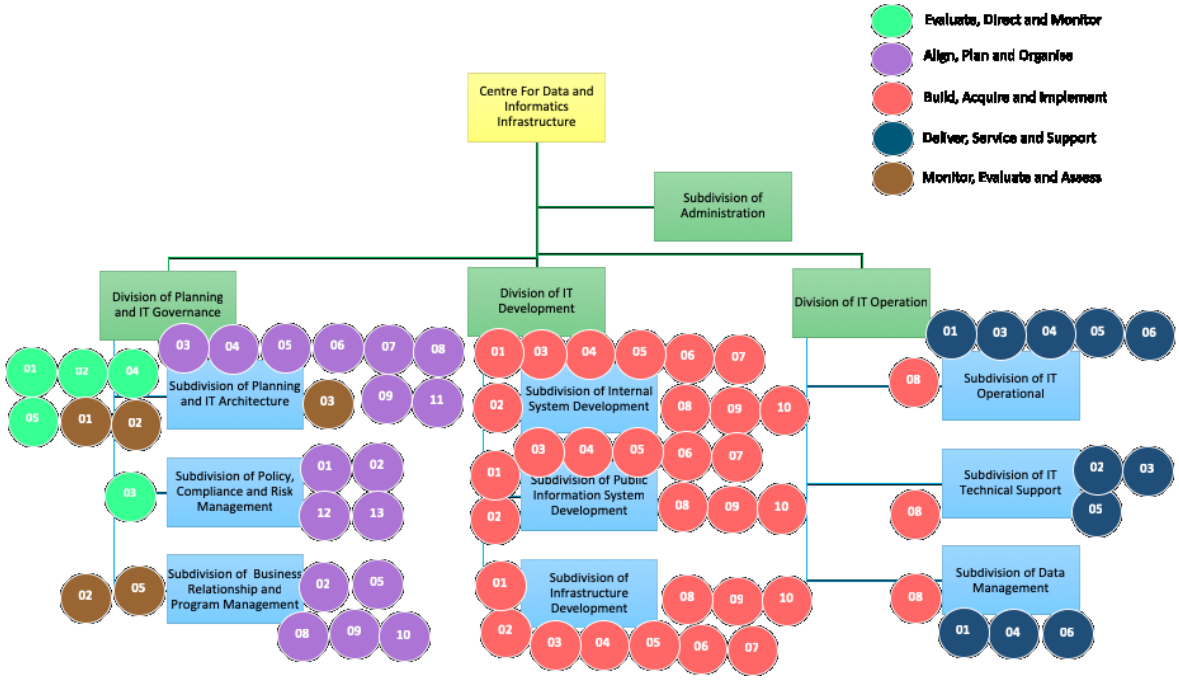

Figure 23. Mapping COBIT 5 Processes to New Proposed Structure (3 Divisions)

Figure 23 show the result of analysis COBIT 5 processes with the proposed structure. Overall, it may be said that the combination of three different divisions can cover main processes in CDII and fit with regulation boundary as mentioned earlier in this section.

5.2 Realistic IT Organisational structure (Two Divisions)

As indicated in previous section, an ideal IT organisational structure for CDII has been made to cater the complete IT processes in COBIT 5. We send the proposed model to be checked by CDII management, in this research the head of Sub-Division of Application Development was asked to give feedback. According to her the proposed structure as shown in Figure 23 might be enough to fulfil the need of organisation and could be brought to high-level management meeting. The ministry needs several approval and validation regarding restructure process. However, there is one problem of the proposed model which is based on Bureau of Human Resources and Organisation, it would be hard to add more division right now. Taking into account the change capabilities and boundary conditions currently in place, it would be advisable to leave it at 2 divisions. In order to follow up the feedback, we conduct further analysis.

In next part, we proposed an adjustment of the IT organisational for CDII. The consequence would be to keep the current formation in which the centre consists of two divisions and each division has three sub-divisions. Compare to previous result, we need either to merge or change the IT divisions in given circumstances. Moreover, she recommends to slightly change the name for Division of IT

Operation into Division of Operational and IT Service Management. Following the advices, the proposed structure was revised as mean to fit with these criteria. First, combining planning and building division and leave operation division as it is because current structure must accommodate workloads in delivery, service and support as concern of IT department and these jobs require more resources, as she responded.

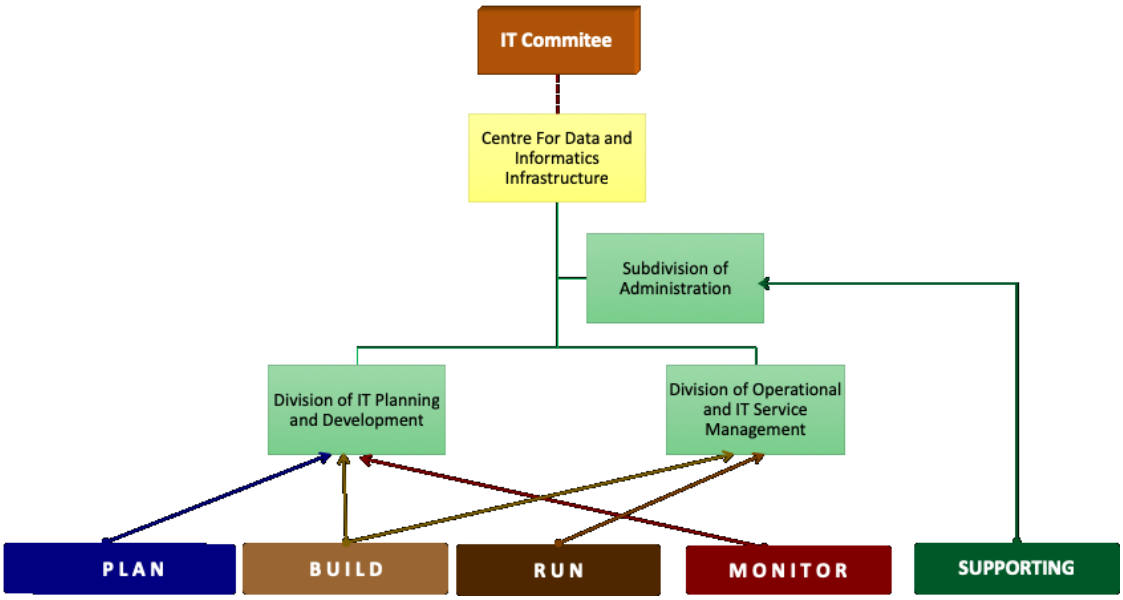

Figure 24. Layout for New Organisational Structure Revised Version

Figure 24 presents layout of the new CDII organisational structure after revision. We decide to merge Division of Planning and IT Governance with Division of IT Development. The detailed form of the layout can be seen in Figure 25.

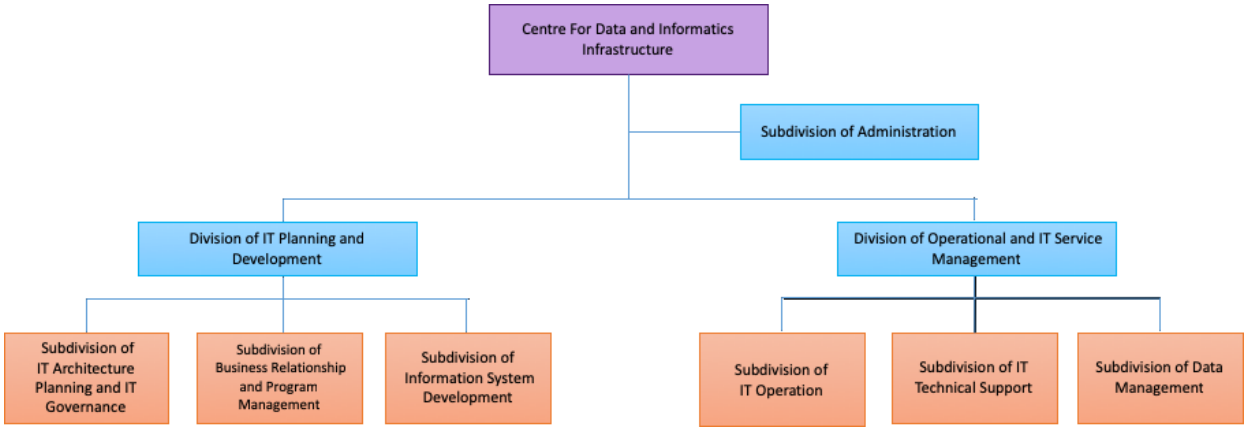

Figure 25. Proposed Organisational Structure (Two Divisions)

Below are the explanations for each division and its sub-divisions duties and responsibilities:

- Division of IT Planning and Development
  activities in this division including Align, Plan and Organize (Plan) and Monitor; Evaluate and Asses (Monitor) and the Build domain, Acquire and Implement (Build).
  It has duties to create, analyse, and update ICT strategic planning, IT roadmap, key performance indicator, IT framework, IT architecture, and manage IT risk. Additionally, it has responsibility to establish, disseminate, and socialise IT standard operation procedure, IT

governance, ICT regulation to end user. It also has to assess and analysis prioritisation of IT programs, as well as to design and develop Information system. Including manage human resource and evaluate and monitor IT performance and IT control. It consists of three sub-divisions namely:

- IT Architecture Planning and IT Governance
  Has duties to create, analyse, and update ICT strategic planning, IT roadmap, key performance indicator, IT framework, IT architecture, standard operation procedure, IT governance and manage service level agreement with end user and IT risk.
- Business Relationship and Program Management
  Has duties to manage IT project including analyse IT program proposal, prioritisation of IT projects, manage IT quality, monitor and evaluate implementation of IT programs according to strategic plan and roadmap. Additionally, it has responsibility to manage relationship and coordinate with end users, suppliers, and IT officers. Lastly, it has tasks to evaluate and monitor IT performance and IT control in ministry.
- Information System Development
  Has duties to design and develop information systems, databases, and network as well as to manage quality of information systems, change management, analyse end user requirements, and manage testing of information systems, databases, and network.

- Division of Operational and IT Service Management
  activities in this division including Deliver, Service and Support (Run).
  It has duties to manage IT services for applications, infrastructures, network, assets, IT configuration, service providers, and data centre. It also has responsibilities to manage incident and problem including recovery planning. IT security management activities are also included in this division. It consists of 3 sub-divisions namely:
  - IT Operation
    Has duties to manage service catalogue, and user satisfaction. Dissemination and socialisation of IT services and, network, infrastructure, and information system release are also included, as well as ensure availability, performance and capacity utilisation of IT services. It also has responsibilities to monitor and analyse assets, IT configuration, back up data and manage IT knowledge base. Data centre management also place under this subdivision.
  - IT Technical Support
    Has duties as helpdesk in organisation including receive report from user, manage incident, problem including analysis of problem root cause and incident trend and support services to users.
  - Data Management
    Has duties to manage database performance, establish data standardisation, monitor and evaluate database capacity, implementation and coordination of data exchange services within and inter organisation. It also has responsibilities to prepare data and information visualisation as well as data analysis. Additionally, this division is also managed organisation's portal, support routine and ad-hoc information presentation to user and manage Decision Support System (DSS) for executives.

The description of the duties and responsibilities as mentioned above includes the activities contained in COBIT 5, which are the IT life cycles that needed within the organisational structure of the company's IT management. This can be known from the results of analysis, assessment and mapping of COBIT 5 domains to the proposed new CDII organisational structure along with a description of their duties.

The results of the analysis of the new CDII organisational structure using COBIT 5 domains can be seen in Appendix 6 and Figure 26 present the visualisation of analysis.

Based on the results of analysis and mapping of COBIT 5 domains, it can be seen that the new CDII organisational structure includes an IT life cycle that includes end-to-end processes relating to IT, namely planning, building / building, run and monitor at the management technical level; and evaluating, directing and monitoring at the governance area. The new CDII organisational structure includes the complete IT processes in it which is a task that should be carried out by a company IT management organisation. This is based on the condition that all COBIT 5 domain activities are included in the new CDII organisational structure.

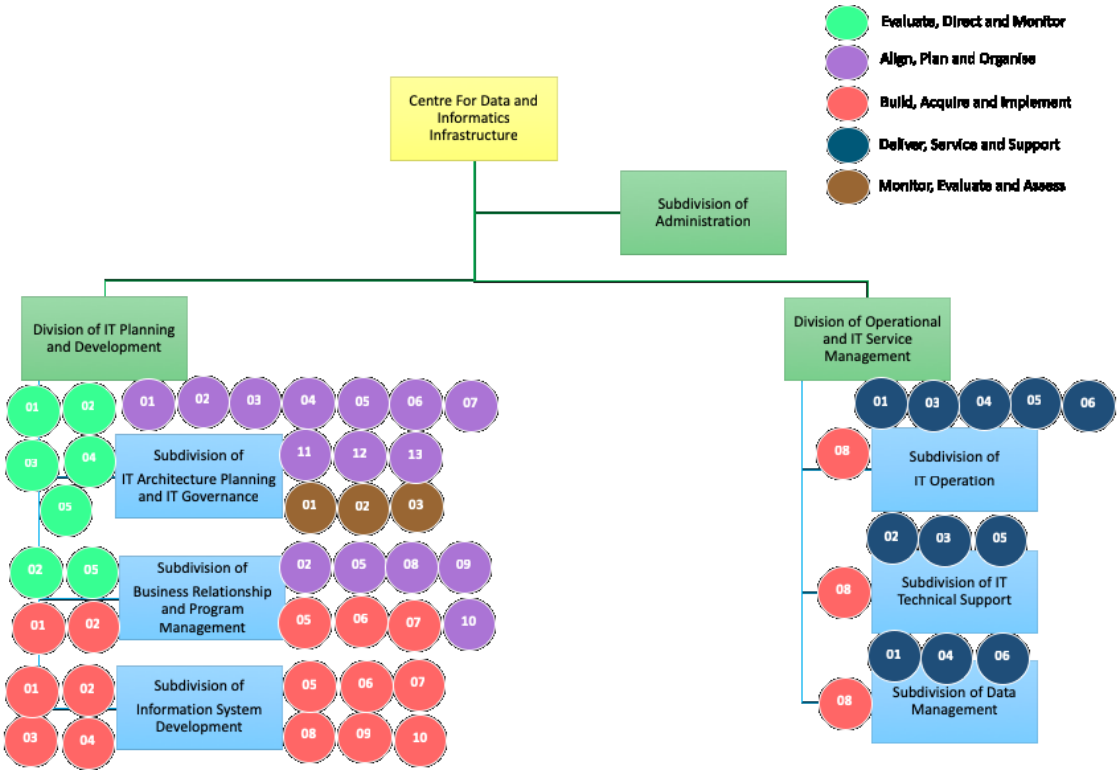

Figure 26. Mapping COBIT 5 Processes to New Proposed Structure (Two Divisions)

As was pointed out in the discussion with management from CDII, it also necessary to map their process framework from section 4.1.5 CDII Process Framework to our proposed structure. The CDII process framework in Figure 17 is use as the base to analyse the new structure because all of the activities listed in process framework need to manage by at least one sub-divisions. Thus, Figure 27 is our suggestion for aligning CDII process framework and proposed organisational structure.

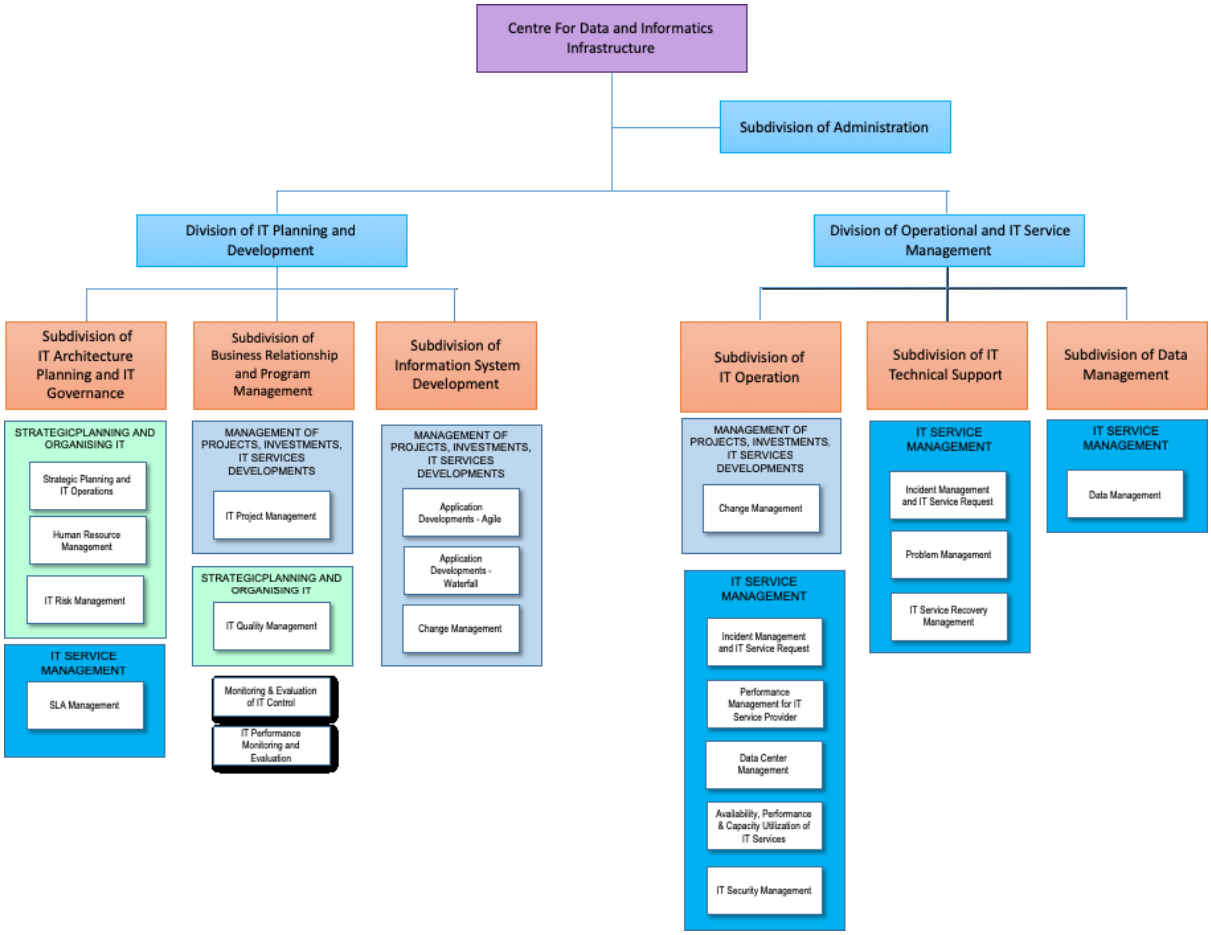

Figure 27. Mapping CDII Process Framework to New Organisational Structure

This chapter has attempted to provide explanation of new IT organisational model for CDII. As previously stated, we begin to create three divisions structure after consideration of regulation and COBIT 5 processes and submit our recommended structure to CDII's management. After that, we got several feedback including change the number of divisions, slightly change the name of sub-divisions and try mapping it with CDII's process framework. The final design for CDII IT organisational structure in Figure 27 has been discussed again and accept by the head of Sub-Division of Application Development.

6 Conclusion and Recommendation

This chapter presents the conclusion and recommendation for this research. We will answer each of our research based on the explanation that was listed in the previous chapter. Furthermore, we will present our recommendation for further implementation of this project.

6.1 Conclusion

Research Question 1: What a suitable framework to redesign IT Department's division for CDII project according to the literatures?

To answer the above question, firstly IT governance concept is explained. Many scholars propose a key element of IT Governance in which the mixed from the structure, processes, and relational mechanism. Different organisation might need different combination of these elements. As for our project, to determine which method that should be used, a literature study was performed. From the papers found, there are little studies regarding how to design IT department structure especially for public organisation. Among them, there is one paper that suggests using COBIT framework as a guideline for a similar project. COBIT is widely known framework in the world that aims to optimize business/IT alignment, allowing to create value from IT and maintain IT related risk while keeping IT activities on track with business objectives. The author uses COBIT 4.1 for their research to determine an ideal structure for IT department of local government agency in Indonesia.

Other relevant literatures also show that COBIT framework is frequently found as tools to perform IT governance-related research for public sector in Indonesia as shown in Appendix 2. Based on early discussion, COBIT is also recognizes by the employees of CDII, making it as a potential framework for our project. Further examination is conducted in order to give a reasonable justification for our choice. Since there are many versions of COBIT, the next step will be to define which version should we use. The previous work regarding redesign IT organisation is performed in 2012 using COBIT 4.1 probably due to the COBIT 5 was launching in the same year and many people were still learning about it. Right now, the latest version COBIT 5 is out and it has many upgrades compare to the previous release. Moreover, the structure of COBIT 5 is suitable for this research. Hence, we decided to use it as a guideline for the master thesis project.

Research Question 2: How could the chosen framework in RQ1 be applied to redesign the IT department?

We tried to examine COBIT framework further to create a plan for our master thesis project. Firstly, understanding the backbone of COBIT 5 which is the five principles namely meeting stakeholder needs, covering the enterprise end-to-end, applying a single integrated framework, enabling a holistic approach, and separating governance and management. For this phase the important part is to derive an IT related goal from organisation's goal in order to keep IT activities align with business strategy and deliver value for stakeholders. COBIT 5 provides goal cascade technique to help practitioner conduct this activity. Goal cascade in COBIT 5 is a mechanism to translate stakeholder needs into desired processes.

In the next phase, the proposed processes from COBIT 5 called the process reference model are presented to give valuable information on how typical practices relating to IT activities are found in the enterprise. Afterward, we performed the gap analysis to define which process is already implemented, partially implemented or not implemented at all, in order to form an ideal structure for

CDII. In conclusion, COBIT 5 gives a straightforward description of how to design IT organisational structure in enterprise and therefore can be implemented for CDII's project.

Research Question 3: What is the current condition in CDII as described by the chosen framework?

The analysis of current condition is needed to identify the strength, weakness, and uniqueness of IT organisation in general as well as its potential and problems that the employees are facing in a daily basis. To understand the current condition in organisation especially IT-related activities, we gather data from documents, observation, and interviews. The explanation about CDII divided into different sections in which in the beginning we describe the organisation's profile including the size of organisation as well as its duties and responsibilities. Next, a brief description of current IT services portfolio is showed to give reader understanding of current workload and problems faced by management and staff.

Regarding its nature as governmental organisation, CDII is restricted by certain rules and regulations related to IT governance. Those regulations can be used as consideration to design organisational structure. Finally, for COBIT 5 assessment, we skip scoping the IT processes using goal cascade method in COBIT 5 framework since it was advised that the client want to include all the processes into their new structure. Thus, this situation forces as to asses using 37 processes in COBIT 5 domain. Because of time constraints during case study, we decided to simplify the assessment stage and rating criteria.

A holistic IT life cycle in COBIT includes end-to-end processes related to IT such as plan, build, run and monitor at the management area; and evaluate, direct and monitor at the governance area. However, the analysis of CDII current organisational structure using the COBIT 5 framework shows that the CDII only implement few of these activities. There are only 6 out of 37 domain processes implemented right now namely BAI01-Manage Programmes and Projects, BAI02-Manage Requirements Definition, BAI03-Manage Solutions Identification and Build, BAI04-Manage Availability and Capacity, BAI06-Manage Changes and DSS01-Manage Operations.

Research Question 4: What is an appropriate organisational structure for CDII to achieve its goal?

This report has worked towards answering the main research question and solving the problem about new organisational structure for CDII. We need to consider both organisational limitation and goals to determine an appropriate structure of CDII. In term of organisational goal, to achieve the desired organisational structure, CDII needs to adopt comprehensive IT processes that covers strategic planning, IT governance and IT policy (plan), designing, building, developing, testing and quality assurance of IT services (build), planning, managing, monitoring and operating IT services request and helpdesk (run); and management of IT service performance (monitors). In addition to that, as governmental organisation CDII are restricted by certain rules and regulations. The rule for government agencies stated that a work unit within ministry that operate as Centre can have a maximum of three divisions, nine sub-divisions, and one sub-divisions of Administration. Thus, for the first design, three divisions are created to accommodate CDII need. These three divisions are Division of Planning and IT Governance that include activities in the domain Align, Plan and Organize (Plan) and the domains Monitor, Evaluate and Asses (Monitor), then Division of IT Development which include activities in the Build domain, Acquire and Implement (Build) and lastly Division of IT Operation that include activities in the domain of Deliver, Service and Support (Run).

The initial design illustrated in Figure 22 consist of three divisions and nine sub-divisions. We considered it as an ideal organisational structure based on our analysis. However, after discussion with one of the managements in CDII, the structure needs to be changed. The reason is because Bureau of Human Resources and Organisation in ministry stated that, it would be hard to add more division since

the organisation doesn't have enough resources to add the nomenclature and it will be hard to achieve such goal. Given these circumstances, we have to revise our design by reduce divisions into 2. We suggest merging divisions for build processes with division of plan and monitor and leave the division for Run activities as the way it is. The main intention is because in CDII activities for Delivery, Service and Support still consider most important and will need more resource. Figure 25 presents the propose organisational structure for CDII that comprises of two divisions namely Division of IT Planning and Development and Division of Operational and IT Service Management.

Under the Division of IT Planning and Development, there are three sub-divisions which are IT Architecture Planning and IT Governance, Business Relationship and Program Management and Information System Development. Division of Operational and IT Service Management consists of three sub-divisions namely IT Operation, IT Technical Support, Data Management. To complete the research, the proposed model is mapped with the 37 processes in COBIT 5 to show the differences between current condition of the proposed structure. The outcome can be seen in Figure 26. The structure was accepted by the head of Sub-Division of Application Development. We also need to check the proposed structure with current CDII process framework in Figure 17. Hence, Figure 27 represent the mapping result and show that with the proposed model, all the activities in CDII process framework has at least one subdivision that responsible to run that processes.

6.2 Recommendation

As mentioned in the first chapter, main objective of this study is to determine a new IT organisational structure for CDII. It is important to bear in mind that the result would be use as preliminary process for restructuring CDII. This report serves as the first draft of proposal for CDII's management. However, limited time constraint and feedback from stakeholders might hold us from delivering the best result. In fact, we acknowledge that our result might contains some deficiencies and bias. Thus, we recommend taking further action to improve the final product for CDII. For example, conducting survey for CDII's user and stakeholders could give information about their thought and concern regarding the proposed structure as well as their expectation from IT department. In fact, the goal of IT department is to serve their user and having a validation and opinion from user is important issue. In the near future, we also suggest benchmarking with other government organisation in Indonesia particularly the institution that has good reputation for their IT performance for short term planning. It is important to gain understanding through this process and learn from experiences.

In the earlier of chapter 5, it was mentioned that we also read through the regulation of ministry of finance's organisational structure. We only gain information about their current state and it is not enough because we don't know their reason and implementation right now. It would be better if we can interview and observe their IT department. For long term planning, not only benchmark other similar agencies, we could benchmark other companies outside of our industry because we should not limit our scope to get more valuable insights and knowledges and this event should not just a one-time occasion.

Another significant aspect of our research is about the framework that we use. We decide to work using COBIT 5 because it is well-known framework in Indonesia. During case study, we encounter challenges when implement this assessment. Considering 37 processes that need to be assed is too overwhelming given limited time. An article from De haes et. al (2013) points out that the adoption of COBIT 5 in general face challenge because of the framework's perceived complexity is high due to subjectivity from implementor. ISACA tried to cover all relevant aspect of IT-related activities and made the framework grown too complex. For this case particularly, the IT processes is too wide and to give a complete view of each IT controls in organisation is impossible in this study. Nevertheless, it is still giving us valuable information related IT activities in organisation, so I would suggest using COBIT

5 framework as a baseline then customize it into our needs, instead of completely follow the framework when doing IT-related projects or assessment. We could use its content to work on specific subjects with adaptation and adoption depending on situation and circumstances.

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Appendix 1

Literature Review Stages using Grounded Theory from Wolfswinkel et al. (2013)

STAGE		TASK
1	**DEFINE**	
1.1	The criteria for inclusion/exclusion	• Inclusion: 1) written in English and Bahasa, 2) domain context: general, Asia, specifically Indonesia, 3) Title contain one or more keyword related to IT governance for public sector or IT organisational structure, 4) general studies/popular literatures about selected concept (definition of IT governance, comparison of IT governance framework, organisation theory, public sector theory), 5) regulations in Indonesia regarding IT governance/e-government/Strategic Planning/Organisational structure • Exclusion: Refer exclusively to IT management or enterprise architecture
1.2	Identify the fields of research	IT Governance, Organisation Theory, e-Government, IT Business Alignment
1.3	Determine the appropriate sources	• Database for documents in English: google scholar, Scopus, the web of science • Database for documents in Bahasa: google scholar
1.4	Decide on the specific search terms	• Q1 (Query in Bahasa): Tata kelola Teknologi Informasi Pemerintah/sektor publik • Q2 (Query in English): IT Governance or IT organisational structure and public sector/government to search the definition of the term also include a query that only contains one concept ex: Query= IT Governance, Query= Public Sector etc
2	**SEARCH**	
3	**SELECT**	
3.1	Refine the Sample	Filter out doubles
		Refine samples based on abstract and title
		Refine samples based on Full Text
		Forward and backward citation • after several iterations, the number of selected Papers in Bahasa is 44 and 37 in English • we choose only specific papers that closely related to our topic
4	**ANALYZE**	
		Selective Coding: IT Governance, IT Governance Framework, IT Governance for Public Sector, IT Organisational structure
5	**PRESENT**	

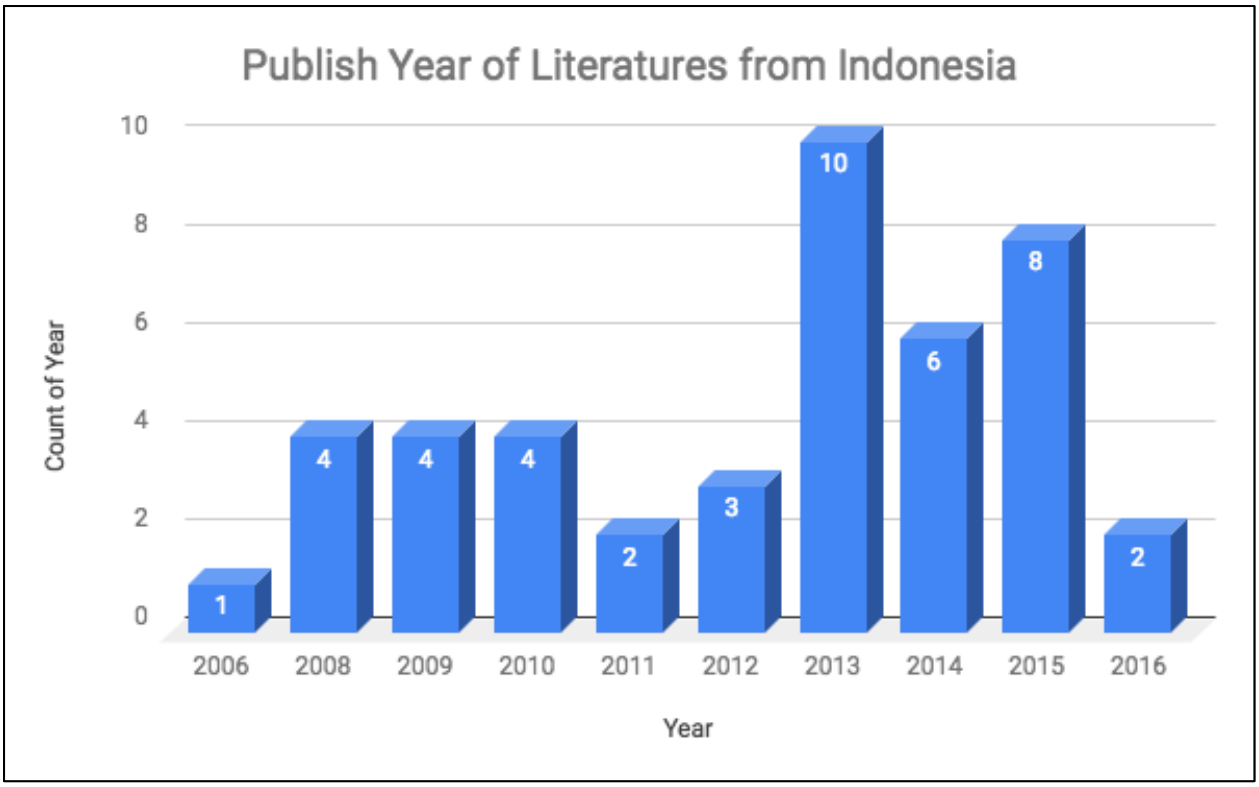
Appendix 2

List of Research in Indonesia Government

No	Title	Year	Author	Domain		Framework
1	Analisa Kesenjangan Tata Kelola Teknologi Informasi Untuk Proses Pengelolaan Data Menggunakan Cobit (Studi Kasus Badan Pemeriksa Keuangan Republik Indonesia)	2010	Hartanto et al	BPK	National gov. agency	COBIT 4.0
2	Analisa Penerapan Togaf Dan Cobit Dalam Tata Kelola Teknologi Informasi Sebagai Usulan Pada Kementerian Energi Dan Sumber Daya Mineral	2010	Ade Supriatna	Kementrian ESDM	National gov. agency	COBIT 4.1
3	Analisis Kebutuhan Stakeholder Dalam Rangka Mengembangkan Model Tata Kelola Te Knologi Informasi Dengan Kerangka Kerja Cobit 5	2012	Adikara	University Esa Unggul	Private University	COBIT 5
4	Analisis Kebutuhan Tata Kelola Teknologi Informasi (TI) pada Implementasi Program Universal Service Obligation (USO)Studi Kasus Implementasi Pusat Layanan Internet Kecamatan (PLIK)	2014	Susanto	Kominfo program (USO)	National gov. agency	COBIT version not descibed
5	Analisis Tata Kelola Teknologi Informasi Sistem E-Ktp Pada Dinas Kependudukan Dan Catatan Sipil Kabupaten Ogan Komering Ilir Menggunakan Kerangka Kerja Cobit	2013	Pratama	Sistem E-Ktp Pada Dinas Kependudukan Dan Catatan Sipil Kabupaten Ogan Komering Ilir	Local gov. agency	COBIT 4.1
6	Analisis Tingkat Kematangan E-Government Menggunakan Framework Cobit 5 (Studi Kasus : Dinas Perdagangan Dan Perindustrian Kota Surabaya)	2016	Kristanto et al	Dinas perdagangan dan perindustrian Surabaya	Local gov. agency	COBIT 5
7	Audit Control Capability Level Tata Kelola Sistem Informasi Menggunakan Cobit 5 (Studi :Direktorat Tik Upi Bandung)	2015	Hidayat	UPI	Public University	COBIT 5
8	Audit IT Governance Kabupaten Sleman	2009	Lusiani	Kabupaten sleman	Local gov. agency	COBIT 4.0
9	Audit Keamanan Sistem Informasi Pada Kantor Pemerintah Kota Yogyakarta Menggunakan Cobit 5	2015	Ciptaningrum et al	Pemkot yogya	Local gov. agency	COBIT 5
10	Audit Sistem Informasi Manajemen Aset Berdasarkan Perspektif Proses Bisnis Internal Balanced Scorecard Dan Standar Cobit 4.1 (Studi Kasus: Pt. Pertamina (Persero))	2012	Dewi et al	PT. Pertamina	State owned corporation	COBIT 4.1
11	Audit Tata Kelola Sistem Kepegawaian Dinas Tenaga Kerja Dan Transmigrasi Provinsi Sumatera Selatan Dengan Kerangka Cobit Versi 5	2014	Cholil et al	Dinas Tenaga Kerja Dan Transmigrasi Provinsi Sumatera Selatan	Local gov. agency	COBIT 5
12	Audit Tata Kelola Sumber Daya Teknologi Informasi Dengan Kerangka Kerja Cobit 4.1 Untuk Evaluasi Manajemen Pada Badan Pengawasan Keuangan Dan Pembangunan	2014	Hidayah et al	BPK	National gov. agency	COBIT 4.1
13	Evaluasi Kesesuaian Struktur Organisasi Pengelola Teknologi Informasi dengan Rencana Jangka Panjang Instansi (Studi Kasus pada Dinas XYZ)	2012	Ghozali & Shodiq	Dinas 'XYZ'	Local gov. agency	COBIT 4.1
14	Evaluasi Penerapan Teknologi Informasi Di Perguruan Tinggi Swasta Yogyakarta Dengan Menggunakan Model Cobit Framework	2008	Setiawan	Private Universities in Yogyakarta	Private University	COBIT 4.1
15	Evaluasi Tata Kelola Teknologi Informasi Menggunakan Kerangka COBIT 4.1 Pada Lembaga Pemerintah (Studi Kasus: Pemerintah Kota Salatiga)	2013	Tambotoh	Pemkot salatiga	Local gov. agency	COBIT 4.1

No	Title	Year	Author	Domain		Framework
16	Evaluasi Tata Kelola Teknologi Informasi Pada Sistem Pendidikan Jarak Jauh Menggunakan Framework Cobit 5 (Studi Kasus: Sekolah Tinggi Ilmu Kepolisian-Perguruan Tinggi Ilmu Kepolisian)	2014	Wandita	Sekolah Tinggi Ilmu Kepolisian-Perguruan Tinggi Ilmu Kepolisian	Public University	COBIT 5
17	Evaluasi Tingkat Kematangan Teknologi Informasi Pada Pt Pal Indonesia (Persero) Dengan Pendekatan Cobit	2013	Purnama & Samopa	Pt Pal Indonesia (Persero)	State owned corporation	COBIT 5
18	Implementasi Enterprise Architecture Perguruan Tinggi	2010	Surendro & Yunis	Universitas di Indonesia	Private University	TOGAF ADM
19	Implementasi Tata Kelola Teknologi Informasi Perguruan Tinggi Berdasarkan Cobit 5 Pada Laboratorium Rekayasa Perangkat Lunak Universitas Esa Unggul	2013	Adikara	University Esa Unggul	Private University	COBIT 5
20	Kajian Tata Kelola It Berdasarkan Indeks Kami Pada Universitas Pakuan Bogor	2014	Hidayati	University of Pakuan (UNPAK) Faculty of MIPA Bogor	Private University	index KAMI Methode which is an adoption of ISO/IEC 27001,
21	Merancang It Governance Dengan Cobit & Sarbanes-Oxley Dalam Konteks Budaya Indonesia	2006	Tarigan	Not Available	Not Available	Mix of COBIT, SOX-COSO
22	Metode Audit Tata Kelola Teknologi Informasi di Instansi Pemerintah Indonesia	2013	Mustofa & Setiawan	NA	National gov. agency	no explanation
23	Metode Pemeringkatan E-Government Indonesia (Pegi) Untuk Audit Tata Kelola Teknologi Informasi	2013	Fitriansyah et al	PDAM Kota Denpasar	State owned corporation	PeGI
24	Model Arsitektur Sistem Dan Teknologi Informasi Pada Organisasi Sektor Publik	2015	Haryono	NA	National gov. agency	TOGAF ADM
25	Pembuatan Sop Menurut Permenpan No.52 Tahun 2011 Dengan Best Practice Cobit 5 Dan Itil V3	2013	Farid et al	Sub Bagian Pelayanan Teknis, Sandi dan Telekomunikasi (SBPTST)	Local gov. agency	COBIT 5
26	Penerapan Tata Kelola Teknologi Informasi Dan Komunikasi Pada Domain Align, Plan and Organise (Apo) Dan Monitor, Evaluate and Assess (Mea) Dengan Menggunakan Framework Cobit 5 Studi Kasus: Stmik Pelita Nusantara Medan	2015	Sagala & Sihotang	Stmik Pelita Nusantara Medan	Private University	COBIT 5
27	Penerapan Tata Kelola Teknologi Informasi Dengan Menggunakan Cobit Framework 4.1 (Studi Kasus Pada Rsud Bari Palembang)	2015	Pribadi	RSUD BARI PALEMBANG	Public Hospital	COBIT 4.1
28	Penerapan Tata Kelola Teknologi Informasi Dengan Menggunakan Cobit Framework 4.1 Studi Kasus Pada Pt. Perkebunan Nusantara Iii Medan (Persero)	2015	Sihotang	Pt. Perkebunan Nusantara Iii Medan (Persero)	State owned corporation	COBIT 4.1
29	Pengukuran Tingkat Kesiapan Kantor P Emerintahan Desa Dalam Penerapan Masterplan Teknologi Informasi Dan Komunikasi (Tik) Perkantoran Desa Menggunakan Kerangka Kerja Cobit 4.1	2015	Asyikin et al	kantor Pemerintahan Desa	Local gov. agency	COBIT 4.1
30	Penyusunan Tata Kelola Teknologi Informasi Untuk Pemerintah Kabupaten Ngawi	2009	Wibowo	Pemkab Ngawi	Local gov. agency	COBIT version not descibed
31	Penyusunan Tata Kelola Audit E-Procurement Instansi Pemerintah	2013	Nugroho & Sancoyo	E-Procurement Instansi Pemerintah daerah banten	Local gov. agency	COBIT 5
32	Penyusunantata Kelola Teknologi Informasi Untuk Pemerintah Kabupaten Bengkalis	2009	Purnama	Pemkab bengkalis	Local gov. agency	COBIT version not descibed

No	Title	Year	Author	Domain		Framework
33	Perancangan Model Tata Kelola Ketersediaan Layanan Ti Menggunakan Framework Cobit Pada Bpk-Ri	2010	Purnomo & Tjahyanto	BPK	National gov. agency	COBIT 4.1
34	Perancangan Strategis Sistem Informasi It Telkom Untuk Menuju World Class University	2009	Setiawan	IT Telkom	Private University	Growing Enterprise Architecture Framework
35	Perancangan Tata Kelola Infrastruktur Teknologi Informasi dan Komunikasi DinasPerhubungan, Komunikasi, dan Informatika Kota Banda Aceh Dengan MenggunakanMetode Ward and Peppard dan Cobit 5	2014	Yusuf	DinasPerhubungan, Komunikasi, dan Informatika Kota Banda Aceh	Local gov. agency	COBIT 5
36	Perancangan tata Kelola Teknologi Informasi Dengan Menggunakan Metode Cobit4 .1 (Studi Kasus Uin Suska Riau)	2013	Nastiti	Uin Suska Riau	Public University	COBIT 4.1
37	Perancangan Tata Kelola TI Dengan Menggunakan Framework Cobit 5 (Studi Kasus: Pemerintah Kab. Jeneponto)	2016	Adhipta et al	Pemerintah Kab. Jeneponto	Local gov. agency	COBIT 5
38	Perancangan Tatakelola Teknologi Informasi Untuk Peningkatan Layanan Sistem Informasi Kesehatan (Studi Kasus Dinas Kesehatan Kabupaten Jepara)	2015	Wahono	Dinas Kesehatan Kabupaten Jepara	Local gov. agency	COBIT 4.1
39	Rancangan Tata Kelola Ti Untuk Institusi Pemerintah Studi Kasus Bappenas	2008	Putra & Sensune	Bappenas	National gov. agency	COBIT 4.1
40	Rancangan Tatakelola Teknologi Informasi Untuk Pabrik Pupuk	2008	Surendro	PT XYZ Pabrik Pupuk	State owned corporation	COBIT version not descibed
41	Strategis Sistem Informasi Dan Tatakelola Teknologi Informasi: Studikasus Pada Rumah Sakit Xyz	2008	Purwanto	Rumah Sakit XYZ Provinsi Lampung	private hospital	no explanation
42	Studi Kesiapan Pemanfaatan Teknologi Informasi Dan Komunikasi Serta Implementasi E-Government Dengan Kerangka Kerja Cobit	2011	Setiawan	Kominfo (MCI)	National gov. agency	COBIT 4.0
43	Tata Kelola Ti Yang Efektif Di Organisasi Pemerintahan Daerah	2013	Amali	organisasi pemerintahan provinsi Gorontalo	Local gov. agency	no explanation
44	Tingkat Kematangan Tata Kelola Teknologi Informasi (IT Governance) Pada Layanan Dan Dukungan Teknologi Informasi (Kasus : Perguruan Tinggi Swasta Di Kota Semarang)	2011	Supradono	Perguruan Tinggi Swasta Di Kota Semarang	Private University	COBIT 4.0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Count of Year
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4
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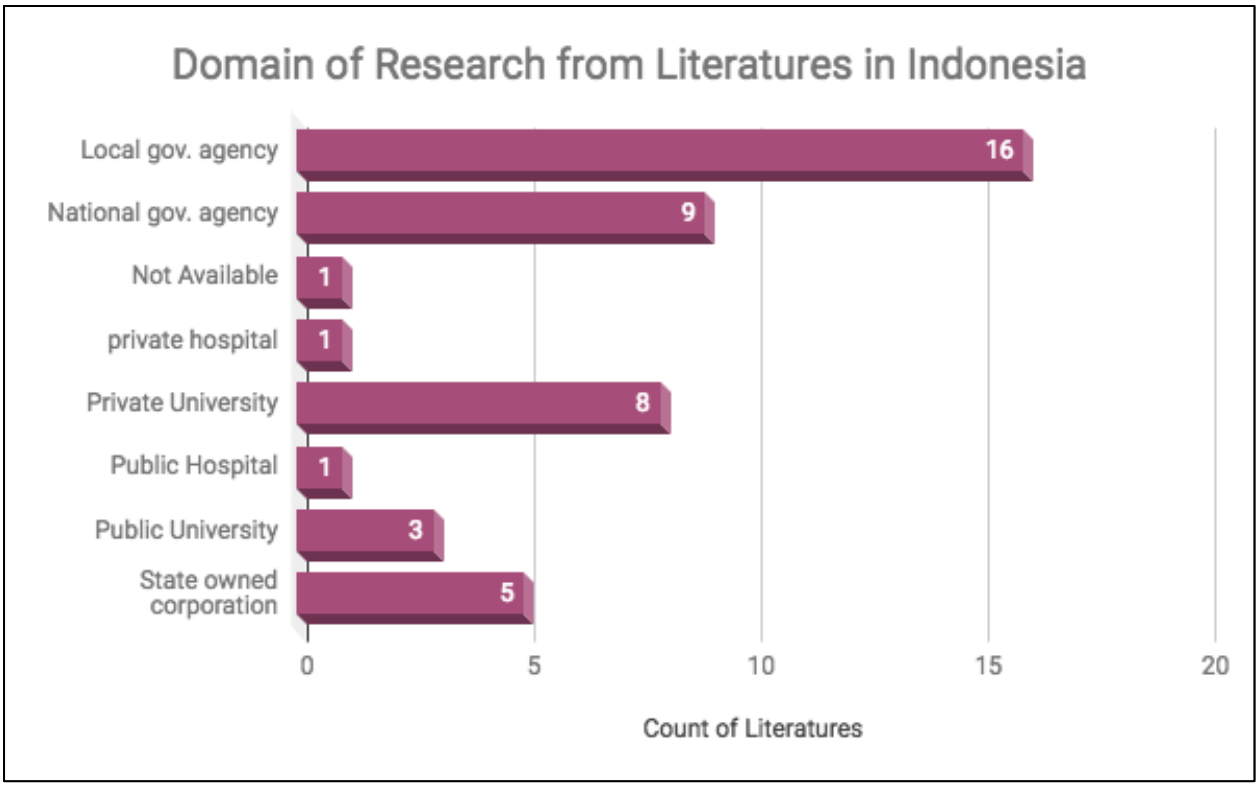
2014
2015
2016
Year


Domain of Research from Literatures in Indonesia
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National gov. agency
Not Available
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Private University
Public Hospital
Public University
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8
1
3
5
0
5
10
15
20
Count of Literatures

Appendix 3

Interview Question

Participants that are going to be interviewed are

1. Head of CDII as well as CIO of Ministry
2. Head of Informatics Infrastructure Division
3. Head of System Data Division
4. Head of Subdivision of Application Development

Semi-structured Interview Questions

General information:

1. What is your name?
2. What department do you work in and what is your position? Which best describes your current position? Is it IT role or Management role?
3. How long have you been working in: (Please specify) CDII? Total working experience?

Organisational settings:

1. What are the vision and mission that guide your organisation?
2. What are your organisation's strategic goals? What are the unit goal/objectives?
3. What best describes your department's IT goal?
4. What are your organisation's core services?
5. What is the size of your organisation? The number of business units? Overall staff? IT staff?
6. List of your main job description
7. List of your ad-hoc job description
8. Do you have a budget line for IT? If yes, what is its percentage of the overall ministry's budget?
9. Is the ICT strategic plan in place? If yes to what extent is it implemented?
10. Are the IT policies and procedures in place? If yes to what extent are they implemented?
11. How critical is IT to the overall strategic direction and achievement of the organisation's goal?
12. Do you have supportive, effective and efficient management in your division?
13. Can you describe the work environment or culture and its management style in which you have experienced the most success?
14. In the task given, do you have a timeline (deliverable/response time) to finish your job?
15. What factors are essential to an organisation and must be present for you to work most effectively?
16. Regarding the current situation, what do you think lack in your department structure? What problems still exist that the current structure could not overcome?
17. What roles and function do you need to run the operation effectively?
18. Could you provide any organisational documents?

Appendix 4

Regulation of CDII Current Organisational Structure

As regards of Chapter XI of the ministerial regulation No. 1 of 2016, it regulates CDII as follows:

Part 1. Roles, Duties, and Functions

Article 711

1. Centre for Data and Informatics Infrastructure is under and responsible to the Minister through the Secretary-General.
2. The Head of the Centre heads the centre for Data and Informatics Infrastructure Centre.

Article 712

Centre for Data and Informatics Infrastructure has the task of implement the development, management, and utilisation of information assets of data and informatics facilities in the ministry.

Article 713

To perform the tasks referred to in Article 712, the Centre for Data and Informatics Infrastructure shall organise several functions, which are:

a. provides technical policies for IT infrastructure, Information systems, and data;
b. executes IT infrastructure, Information systems and data activities in the organisation;
c. monitors evaluate and report the activities regarding IT infrastructure, Information systems and data; and
d. To Implement a central administration.

Part 2. Organisational structure

Article 714

Centre for Data and Informatics Infrastructure, consist of:

a. Informatics Infrastructure Division;
b. System Data Division; and
c. Subdivision of Administrations

Part 3. Informatics Infrastructure Division

Article 715

Information Infrastructure division has the responsibility to provide technical policies, implement and monitor, evaluate and report about IT infrastructure, as well as electronic procurement services in ministry.

Article 716

To realise the task as referred to in Article 715, Informatics Infrastructure Division shall conduct activities in the following:

a. prepares materials for technical policies regarding maintenance of information assets, information technology equipment and devices, servers, internal and inter-organisation network, and backup and disaster recovery centres, as well as procurement activities;
b. implements activities regarding maintenance of information assets, information technology equipment and devices, servers, internal and inter-organisation network, and backup and disaster recovery centres, as well as procurement activities;
c. monitors evaluate and reports about information assets, information technology equipment and devices, servers, internal and inter-organisation network, and backup and disaster recovery centres, as well as procurement activities;

Article 717

Informatics Infrastructure Division consists of:

a. Subdivision of Network;
b. Subdivision of IT equipment;
c. Subdivision of Information Security

Article 718

1) Subdivision of Network has duties to provide technical policies, implement and monitor, evaluate and report maintenance of information assets, internal and inter-organisational network devices, as well as backup networks and recovery centres.
2) Subdivision of IT equipment has duties to provide technical policies, implement and monitor, evaluate and report the management and maintenance of information technology equipment, servers and supporting facilities including backups and disaster recovery centres.
3) Subdivision of Information Security has duties to provide technical policies, implement and monitor, evaluate and report the information security and protect IT assets and electronic procurement services.

Part 4. System Data Division

Article 719

System Data Division has the responsibility to provide technical policies, implement and monitor, evaluate and report on Information systems and data.

Article 720

To realise the task as referred to in Article 719, System Data Division shall conduct activities in the following:

a. prepares materials for technical policies regarding portal and content management and its maintenance, data collection, processing and presentation, and application development;
b. To implement activities regarding portal and content management and support, data collection, processing and performance, and application development;
c. monitors evaluate and reports about portal and content management and support, data collection, processing and present, and application development;

Article 721

System Data Division consists of:

a. Subdivision of Portal and Content;
b. Subdivision of Data Collecting and Processing;
c. Subdivision of Application Development

Article 718

1. Subdivision of Portal and Content has duties to provide technical policies, implement and monitor, evaluate and report activities regarding portal and content management and its maintenance.
2. Subdivision of Data Collecting and Processing has duties to provide technical policies, implement and monitor, evaluate and report activities regarding data collection, processing and presentation
3. Subdivision of application Development has obligations to provide professional procedures, implement and monitor, assess and report activities regarding application development;

Part 5. Subdivision of Administration

Article 723

Subdivision of Administration has the duties of preparing the program and human resource development, administration matters, general affairs as well as monitors, evaluates, and makes reports of activitie

Appendix 5

Mapping COBIT Reference Process to the current CDII structure

ID PROCESS	PROCESS NAME	SCOPE	PURPOSE	ANALYSIS		CURRENT STRUCTURE
				ORGANISATION'S NEED	CRITERIA	
EDM01	Ensure Governance Framework Setting and Maintenance	Evaluate, direct, monitor IT governance system	Provide a consistent approach integrated and aligned with the enterprise governance approach. To ensure that IT-related decisions are made in line with the enterprise's strategies and objectives, ensure that IT-related processes are overseen effectively and transparently, compliance with legal and regulatory requirements is confirmed, and the governance requirements for board members are met.	It is a management level, it requires commitment from stakeholders regarding management and management (evaluating, regulating and supervising) IT governance and a strategic IT decision making model that runs effectively, in line with the organisation's internal strategies and objectives and the organisation's external environment company, and according to stakeholder needs / requirements.	There is a form of commitment from stakeholders, for example in the form of Ministerial Decrees or other forms of commitment statements, regarding IT governance and IT strategic decision-making models.	-
EDM02	Ensure Benefits Delivery	Evaluate, Direct and Monitor IT Investment Management and Value of Investment (Investment in Activities, Assets, Services Initiatives)	Secure optimal value from IT-enabled initiatives, services and assets; cost-efficient delivery of solutions and services; and a reliable and accurate picture of costs and likely benefits so that business needs are supported effectively and efficiently.	It Is a management level, it requires commitment from stakeholders regarding management and management (evaluating, regulating and supervising) investments (initiatives / activities, services, and assets) related to IT effectively and efficiently to support business / operational organisations / companies so that they can provide value / optimal output.	There is a form of commitment from stakeholders, for example in the form of Ministerial Decrees or other forms of commitment statements, regarding management and management of IT investments.	-
EDM03	Ensure Risk Optimisation	Evaluate, Direct and Monitor Risk Management	Ensure that IT-related enterprise risk does not exceed risk appetite and risk tolerance, the impact of IT risk to	It is a management level, it requires commitment from stakeholders regarding management and	There is a form of commitment from stakeholders, for example in the form of a Ministerial Decree or other	-

			enterprise value is identified and managed, and the potential for compliance failures is minimised.	management (evaluating, regulating and supervising) IT related risks (such as identifying, determining and managing risk appetite, risk tolerance, risk threshold) and its impact, effectively and efficiently, and communicating to stakeholders.	form of commitment statement, regarding management and management of IT-related risks.	
EDM04	Ensure Resource Optimisation	Evaluate, Direct and Monitor Resource Management	Ensure that the resource needs of the enterprise are met in the optimal manner, IT costs are optimised, and there is an increased likelihood of benefit realisation and readiness for future change.	It Is a management level, it needs commitment from stakeholders regarding management and management (evaluating, regulating and supervising) IT resources needed by the organisation / company optimally so that IT resources are used in accordance with the priorities of the organisation / company and defined cost limits and can provide benefits and changes to the good for the organisation / company in the future.	There is a form of commitment from stakeholders, for example in the form of a Ministerial Decree or other form of commitment statement, regarding management and management of IT resources.	-
EDM05	Ensure Stakeholder Transparency	Evaluate, Direct and Monitor Communication and Reporting Management to Stakeholders	Make sure that the communication to stakeholders is effective and timely and the basis for reporting is established to increase performance, identify areas for improvement, and confirm that IT-related objectives and strategies are in line with the enterprise's strategy.	It Is a management level, there needs to be commitment from stakeholders regarding management and management (evaluating, regulating and overseeing) performance / performance reporting. Reports to stakeholders are delivered in a complete, timely, accurate and effective manner.	There is a form of commitment from stakeholders, for example in the form of Ministerial Decrees or other forms of commitment statements, regarding management and management of performance / performance reporting.	-
APO01	Manage the IT Management Framework	IT Governance Management (1) Defining organisational structure (2) Arrange and define roles and responsibilities (3) Maintaining enabling management systems (communication), awareness and understanding of IT goals, (4) Optimization of IT Function	Provide a consistent management approach to enable the enterprise governance requirements to be met, covering management processes, organisational structures, roles and responsibilities, reliable and repeatable activities, and skills and competencies.	It is necessary to have a division / sub-division that synchronizes, plans and organizes / organizes an organisation / company IT management and governance framework equipped with a number of policies and communicated to stakeholders and employees / members of the organisation / company to be known and understood.	Maintain organisational / corporate IT governance, mechanisms and authorities in managing information and use of IT within the organisation / company to be in line with applicable policies and procedures.	

		(5) Defining and maintaining information / data owners (6) Management of continuous improvement processes, and (7) Maintain compliance with policies and procedures.				
APO02	Manage Strategy	Management of the IT Plan (Master Plan) (1) Identify the current state of the business environment and IT of the organisation, both internal and external (2) Defining business and IT targets (3) Analyse the gap between the current state of business and IT and the target of business and IT (4) Defining a strategic plan and roadmap, and (5) Communicate the strategy and direction of IT to stakeholders and users in the organisation.	Align strategic IT plans with business objectives. Clearly communicate the objectives and associated accountabilities so they are understood by all, with the IT strategic options identified, structured and integrated with the business plans.	There needs to be fields / sub-sectors that make alignment, planning and organisation / organisation of IT strategies that are cost effective, accurate, accurate, realistic, achievable and in line with the objectives and business strategies of the organisation / company. The strategic plan is then elaborated in strategic initiatives that are equipped and implemented with accountable activity plans. Strategic plans and strategic initiatives are communicated to stakeholders and employees / members of the organisation / company to be known and understood.	Provide a comprehensive view of current business and IT environment conditions (current business and IT conditions), future directions (business conditions and ideal future IT / to be achieved), and initiatives to migrate to the future (strategic plan) / gap analysis => Master IT Plan.	
APO03	Manage Enterprise Architecture	Management of the Company's IT Architecture (1) Develop a vision of organisational architecture (2) Defines architectural references (3) Selecting opportunities and solutions, (4) Defining implementation and architecture migration, and (5) Providing organisational architecture services.	Represent the different building blocks that make up the enterprise and their inter-relationships as well as the principles guiding their design and evolution over time, enabling a standard, responsive and efficient delivery of operational and strategic objectives.	There needs to be a Division / Sub-Division that conducts alignment, planning and setting / organizing standards and reliable IT organisation / company service architecture that supports organisations / companies effectively and agile (fast, active, sustainable) organisational / company changes	Building an IT organisation / company architecture in general that consists of business processes, information, data, applications, and layers technology architecture to effectively and efficiently realize IT strategies.	

APO04	Manage Innovation	Management of IT Innovations (1) Creating an environment conducive to innovations (2) Maintain and maintain an understanding of the organisation's strategy and competitive environment or other limitations so that opportunities for new technologies are wide open (3) Monitor and examine the external environment of technology to identify potential technologies that can provide value to the organisation's IT (4) Assessing the potential of emerging technologies and innovation ideas (5) Recommend appropriate initiatives, and (6) Monitor the implementation and use of innovation.	Achieve competitive advantage, business innovation, and improved operational effectiveness and efficiency by exploiting information technology developments.	There needs to be a sector / sub-sector that synchronizes, plans and organizes / organizes service innovations by utilizing appropriate IT developments that can produce better quality output from organisational / company goals and reduce costs. These innovations are always communicated, known and can be used and become part of the organisational / corporate culture.	Maintain IT levels related to service trends, identify innovation opportunities, and plan the benefits of innovation related to business needs of the organisation / company.	
APO05	Manage Portfolio	Strategic Portfolio Management and IT Investment (1) Establish investment targets (2) Establish the existence and source of funds (3) Evaluating and selecting funding programs (4) Monitor, optimize and report on the performance of investment portfolios through the investment life cycle (5) Maintain investment portfolios of programs and projects, IT services, and IT assets, and	Optimise the performance of the overall portfolio of programmes in response to programme and service performance and changing enterprise priorities and demands.	It is necessary to have a Division / Sub-Division that conducts alignment, planning and organizing / organizing a portfolio of IT service programs (strategic initiatives) that are equipped with IT investments and are defined and aligned with the organisation / company strategy.	Carry out the direction of the strategy set for investment that is in line with the architectural vision of the organisation / company, as well as the desired characteristics of investment and service portfolios, and considers various categories of investment and resources.	

		(6) Manage the achievement of profits.				
APO06	Manage Budget and Costs	Management of IT Budget and Costs (1) Managing financial and IT investment cost accounting (2) Prioritizing resource allocation (3) Creating and maintaining IT investment budgets (4) Creating a financing model and allocation of costs, and (5) Implementation of the cost management process.	Foster partnership between IT and enterprise stakeholders to enable the effective and efficient use of IT-related resources and provide transparency and accountability of the cost and business value of solutions and services. Enable the enterprise to make informed decisions regarding the use of IT solutions and services.	There needs to be fields / sub-sectors that make alignment, planning and arrangement / organisation of budgets and the costs of using resources related to IT in a transparent and accountable (accountable) manner.	Managing IT related to finance both in terms of business and IT functions which include budget, costs, and management benefits	
APO07	Manage Human Resources	Management of Human Resources IT (Human Capital) (1) Maintain appropriate and appropriate staffing (2) Identifying the main key of IT personnel to minimize dependence on someone (3) Defining and maintaining personnel expertise and competency (4) Evaluating employee job performance (5) Identify and track the organisation's HR needs for current and future, and (6) Managing employee contracts.	Optimise human resources capabilities to meet enterprise objectives.	There needs to be a Division / Sub-Division that makes alignment, planning and arrangement / organisation of human capital effectively and efficiently in order to improve competence and skills	Providing a structured approach to managing human resources as assets (human capital), ensuring optimal structure, placement, decision-making rights, and human resource skills.	

APO08	Manage Relationships	Management of Relationships between Company Stakeholders and IT Stakeholders (Reporting) (1) Management of business and IT expectations (2) Identify opportunities, risks and limitations of IT to add business value (3) Management of business relationships with users / customers (4) Coordination and communication with stakeholders regarding the presentation of IT services and solutions to businesses, and (5) Presenting input for continuous service improvement.	Create improved outcomes, increased confidence, trust in IT and effective use of resources.	There needs to be a Division / Sub-Division that synchronizes, plans and organizes / organizes relationships between organisational / company stakeholders and IT stakeholders where both parties know each other's projects / programs and business strategies, plans and needs of the organisation / company and IT are known and understood.	Manage the relationship between business and IT in a formal and transparent way to guarantee: focus on achieving common goals and sharing the results of the organisation / company in supporting strategic goals -> planning business relationships and evaluating (surveys).	
APO09	Manage Service Agreements	Management of IT Service Level Agreements / Contracts (SLA and KPI) (1) Identification of IT services (2) Making guidelines / service catalogue (3) Define and prepare a service agreement (4) Monitor and report service levels, and (5) Check / review contracts and service agreements.	Ensure that IT services and service levels meet current and future enterprise needs.	There needs to be a Division / Sub-Division that conducts alignment, planning and arrangement / organizing service level agreements according to the needs of the organisation / company and IT capabilities.	Aligning services - which can be used / activated with IT - and service level / level with the needs of the organisation / company including identification, specification, design, publication, agreement, and IT monitoring, as well as service level and performance indicators -> policy Agreement (SLA).	
APO10	Manage Suppliers	IT Service Supplier Management (1) Identify and evaluate relationships and contracts with suppliers (2) Select suppliers (3) Manage relationships and contracts with suppliers	Minimise the risk associated with non-performing suppliers and ensure competitive pricing.	There needs to be a Division / Sub-Division that makes alignment, planning and arrangement / organisation of relationships and risks between the organisation / company and suppliers (suppliers).	Manage IT related to services provided by suppliers to meet the needs of the organisation / company, including supplier selection, relationship management, contracts, and reviewing and monitoring supplier performance.	

		(4) Manage supplier risks, and (5) Monitor supplier performance and compliance with agreements / contracts.				
APO11	Manage Quality	Management of Quality Services and Solutions (ISO 9001) (1) Arrange / establish and maintain a Quality Management System (2) Defining and managing standards, practices / applications, and procedures for service quality (3) Focus on quality management on user needs / desires (4) Monitor, control and check quality (5) Integrating quality management into solutions for developing and presenting services, and (6) Maintain continuous improvement of solutions.	Ensure consistent delivery of solutions and services to meet the quality requirements of the enterprise and satisfy stakeholder needs.	There needs to be a Sector / Sub-Sector that conducts alignment, planning and organizing / organizing service quality where stakeholders are satisfied with the quality of service, the results of project presentation and services in accordance with the desired and quality requirements / requirements can be met in all processes.	Define and communicate quality requirements in all processes, procedures, and results of the organisation / company concerned, including controls, monitoring in continuous improvement.	
APO12	Manage Risk	IT Risk Management (Risk Tolerance and Risk Appetite) (1) Identifying and collecting relevant data for identifying, analysing and reporting on IT risks (2) Carry out IT risk analysis (3) Maintain an inventory of risk and risk attributes (4) Clearly convey risks to stakeholders (5) Defining a portfolio of risk management actions, and (6) Responding to risk effectively to avoid large losses due to risk.	Integrate the management of IT-related enterprise risk with overall ERM and balance the costs and benefits of managing IT-related enterprise risk.	There needs to be fields / sub-sectors that make alignment, planning and arrangement / organisation of IT risks (identification, analysis, management and reporting) and Enterprise Risk Management (ERM) effectively.	Identify, assess, and reduce risks related to IT within the tolerance set by the executive organisation / company management -> risk tolerance based on risk appetite.	

APO13	Manage Security	Information Security Management (ISO 27001) (1) Develop, establish and maintain an information security management system (ISMS) (2) Define and manage information security risk treatment plans, and (3) Monitor and examine information security management systems (ISMS).	Keep the impact and occurrence of information security incidents within the enterprise's risk appetite levels.	There needs to be a Division / Sub-Division that conducts alignment, planning and organizing / organizing information security.	Determine, operate, and monitor systems for information security management.	
BAI01	Manage Programmes and Projects	Program and Project Management (Execution of Planning on Project Management: Project Plan) (1) Maintain a standard approach to managing programs and projects with a focus on achieving business values and objectives (needs, risks, costs, schedules, quality) through a consistent path (2) Initiate the program (3) Managing stakeholder agreements / agreements (4) Develop and maintain program plans (scope and delivery of deliverables) (5) Launching and executing the program (6) Monitor, control and report on program results / outputs (7) Start and initiate projects in the program (8) Prepare and maintain a formal and approved project plan (9) Managing the quality of programs and projects	Realise business benefits and reduce the risk of unexpected delays, costs and value erosion by improving communications to and involvement of business and end users, ensuring the value and quality of project deliverables and maximising their contribution to the investment and services portfolio.	There needs to be a Division / Sub-Division that carries out the management of the development and implementation of projects and programs. Project development / implementation management and programs ensure that relevant stakeholders are involved in projects and programs, implementation of the project and program scope as determined, results of projects and programs as expected, projects and programs implemented according to plan, and there are benefits obtained from the implementation of projects and programs.	Development and implementation of IT-related activities and projects programs that have been identified and established in business strategic planning and IT organisations / companies.	Subdivision of Network Subdivision of IT Equipment Subdivision of Portal and Content Subdivision of Application Development

		(10) Managing program and project risks (11) Monitor and control the project (12) Manage project resources and work packages (13) Project closure or project repetition by stakeholders, and (14) Program closure.				
BAI02	Manage Requirements Definition	Management of Requirements Definitions (Requirements) Solutions (1) Defining and maintaining functional business and technical requirements (2) Conduct feasibility studies and formulate alternative solutions (3) Managing risk needs, and (4) Get approval of needs and solutions.	Create feasible optimal solutions that meet enterprise needs while minimising risk.	There needs to be a Sector / Sub-Sector that conducts management defining / identifying the requirements / requirements of projects and programs. Identified requirements must be in accordance with the needs and objectives of the organisation and can produce appropriate solutions. Risks that can occur / emerge from requirements that have been identified can be resolved / found solutions.	Defining the requirements of programs, projects and organisational / business solutions related to IT that are accompanied by risk analysis that can occur / emerge from the implementation of these requirements along with the resolution of these risk problems.	Subdivision of Network Subdivision of Portal and Content Subdivision of Application Development
BAI03	Manage Solutions Identification and Build	Management of Identification and Development / Development Solutions (1) Perform high-level design solutions (2) Design component solutions in detail (3) Develop a solution component (4) Obtain a solution component based on a plan for acquisition of needs and detailed design (5) Building solutions (6) Carry out quality assurance (7) Prepare testing solutions (8) Carry out testing solutions (9) Manage changing needs (10) Maintain solutions, and	Establish timely and cost-effective solutions capable of supporting enterprise strategic and operational objectives.	There needs to be a Division / Sub-Division that conducts management of identification and development / development of solutions from a project / program where the solution must be in accordance with the needs of the organisation / company and requirements, in line with the organisation / company standards / regulations, can identify risks, have security can be audited, and has passed the testing process.	Identifying and planning solutions from IT services that can be obtained from the analysis of the implementation of IT services, both in terms of availability and capacity of services.	Subdivision of Network Subdivision of Application Development

		(11) Defining IT services and maintaining a service portfolio and documenting new and changing service definitions.				
BAI04	Manage Availability and Capacity	Managing Service Availability and Capacity (1) Assess the existence, performance and capacity of current services and create a baseline (2) Assessing the impact on business on the absence of resources (3) Planning new or changing service needs (4) Monitor and review service availability and capacity, and (5) Check and convey the availability, performance and capacity of issues.	Maintain service availability, efficient management of resources, and optimisation of system performance through prediction of future performance and capacity requirements.	There needs to be a Sector / Sub-Sector that carries out availability and service capacity management. Service availability and capacity in accordance with specified requirements / requirements. Issues / problems related to service availability and capacity can be identified and solved / resolved routinely.	Determine, operate and monitor the existence (availability) of the services provided (Service Level Agreement) and the capacity / quantity (capacity) of services or supporting infrastructure, which is accompanied by an analysis of the implementation of the existence and capacity of services, identifying problems that occur or can occur and solutions the solution.	Subdivision of Network
BAI05	Manage Organisational Change Enablement	Management of Enabling Organisational Change: Managing Change in Programs / Projects, whether Sudden or Not, Through Communication, Discussion and Decision at the Stakeholder level. Stakeholder Commitments and Preparations for Business Change. (1) Building a desire to change: defining actions to motivate stakeholders to accept and want to change (2) Establish effective change teams (3) Communicating the desired vision of change (4) Empower the role and identify the winning team	Prepare and commit stakeholders for business change and reduce the risk of failure.	There is a need for a sector / sub-sector that manages to empower IT-related organisational changes in a better direction (strategic change management). These changes can come from stakeholders or not but are understood and accepted by stakeholders and implemented by a change management team that is competent and capable of carrying out, directing and maintaining sustainable change.	Manage / manage empowerment of changes that can occur, whether sudden or not. The changes that occur are analysed the feasibility and risks which are then informed to stakeholders and users to get commitments / agreements from them regarding these changes so as to create a balanced position in accordance with the agreement made and not blame each other. As a simple example: the user asks for the addition of the delete button in the application, so the risk types must be determined for the button addition process, which is then informed to stakeholders and users, so that they can decide whether or not the button is added and their commitment against the decision.	

		(5) Enabling the operation and use of all techniques so that parties involved in the future environment of change can exercise their responsibilities (6) Embedding new approaches, and (7) maintain change.				
BAI06	Manage Changes	Management of Request Changes (Request for Changes) (1) Evaluating, prioritizing and allowing requests for change, changes recorded in the log, prioritized, categorized, assessed, permitted, planned and scheduled (2) Manage emergency changes to minimize further incidents and ensure that changes are controlled and run safely (3) Track and report on the status of changes, ensuring that the agreed changes have proceeded as planned, and (4) Close and document changes.	Enable fast and reliable delivery of change to the business and mitigation of the risk of negatively impacting the stability or integrity of the changed environment.	There needs to be a Sector / Sub-Sector that carries out management of change (operational change management) that occurs in a timely manner and with minimal errors, both official changes that have been informed to stakeholders and reviewed / studied and approved by stakeholders and sudden / emergency (emergency).	Managing / managing own changes operationally (Request For Change / RFC). For example: certain RFC numbers, changes to certain things, recorded, classified whether normal change or emergency change, and then informed to stakeholders and users to be discussed (process information and discussion about these changes to stakeholders and users are in the domain process BAI05)	Subdivision of Network Subdivision of IT Equipment Subdivision of Information Security Subdivision of Data Collecting and Processing Subdivision of Portal and Content Subdivision of Application Development
BAI07	Manage Change Acceptance and Transitioning	Management of Acceptance of Changes and Transitions Acceptance of New Things: Let go off things used to be; Adapt to the way things are or are going to be (1) Arrange and determine the implementation plan	Implement solutions safely and in line with the agreed-on expectations and outcomes.	There needs to be a Division / Sub-Division that conducts management testing, acceptance and release of results / solutions, socialization and transition of the implementation of results / solutions to the project / program. The results / solutions of the project / program must be as expected, fulfil all implementation	Managing the changes and the transition period for receiving these changes. It is necessary to determine the change acceptance criteria, how the criteria and requirements for the transition period for the release of the results of the changes, and the purpose of change => let go of things used to be, adapt to the way things are or are going to be	

		(2) Preparing business processes, systems and data conversion in the migration process (3) Plan an acceptance test (4) Arrange and determine environmental tests (5) Carry out acceptance tests: migration to the production environment (6) Advancing to production and managing releases: the solution is run as a pilot implementation or run parallel with the old solution in a certain period of time and then compared the results, if it is not in accordance with the desired it can be pullback (7) Providing production support for users and IT operations, and (8) Conduct a review after implementation.		plans, and get approval and support from stakeholders.		
BAI08	Manage Knowledge	Knowledge Management (1) Maintain and facilitate a culture of knowledge sharing (2) Identify and classify information sources, both internal and external organisations, to enable effective and operational use of IT business processes and services (3) Organize and contextualize information into knowledge based on classification criteria (4) Using and sharing knowledge, and (5) Evaluate and stop outdated or outdated information.	Provide the knowledge required to support all staff in their work activities and for informed decision making and enhanced productivity.	There is a need for fields / sub-sectors that carry out knowledge management and knowledge sharing to improve employee competencies, skills and productivity.	All knowledge of events, problems / disorders, SOPs, usage manuals are managed / managed in Database Knowledge Management, used and shared (knowledge sharing). Knowledge is identified, classified, updated, improved and becomes an organisational / company culture.	

BAI09	Manage Assets	Management of All Assets (1) Identify and record current IT assets needed to provide services and ensure compliance with configuration management and financial management (2) Managing critical IT assets to increase the reliability and existence of business processes (3) Manage the IT asset life cycle (4) Optimizing the costs of IT assets, and (5) Manage IT asset licenses.	Account for all IT assets and optimise the value provided by these assets.	There needs to be a Division / Sub-Division that conducts IT asset management and management.	Manage / manage assets related to IT: information, people, software, hardware, copyright, facilities and infrastructure.	
BAI10	Manage Configuration	Manage Service Configuration (1) Arrange, define and maintain a configuration model in the Configuration Management Database (CMDB) to record configuration items (CIS) and the relationship between them (2) Arrange, set and maintain configuration and baseline storage in CMDB (3) Maintain and control configuration items (CIS) (4) Produce status and configuration reports, and (5) Check and review the integrity of configuration storage.	Provide sufficient information about service assets to enable the service to be effectively managed, assess the impact of changes and deal with service incidents.	There needs to be fields / sub-fields that carry out management, management and configuration of IT services that are accurate, complete and up to date.	Manage / manage IT service configurations in the Configuration Management Database (CMDB) -> best practice Information Technology Infrastructure Library (ITIL). CMDB forms a storage place for all information relating to IT components called Configuration Items (CIs). CMDB can store CIs from servers, applications, databases, users & contacts, configurations and history.	

DSS01	Manage Operations	Management of IT Service Operations (1) Carry out operational (SOP) procedures and operational works consistently and reliably (2) Managing IT services that are submitted to third parties to maintain company information and reliability of service delivery (3) Monitor IT infrastructure (4) Manage the service environment, and (5) Manage service facilities	Deliver IT operational service outcomes as planned.	There needs to be a Division / Sub-Division that conducts management and management of IT operational activities according to needs and is scheduled. Operational activities are monitored, measured and reported.	Manage / manage daily IT service operations.	Subdivision of Network Subdivision of IT Equipment Subdivision of Information Security Subdivision of Data Collecting and Processing Subdivision of Portal and Content Subdivision of Application Development
DSS02	Manage Service Requests and Incidents	Management of Service Requests and Service Incidents (1) Defines the scheme / pattern of classification of service requests and incidents (2) Record / save, classify and prioritize service requests and incidents (3) Verifying, approving and implementing / fulfilling service requests (4) Research, diagnose and allocate symptoms / signs of incident to determine possible causes of the incident and the solution to the problem (5) Overcoming and restoring services from service incidents	Achieve increased productivity and minimise disruptions through quick resolution of user queries and incidents.	There needs to be a Sector / Sub-Sector that conducts management and management of service requests and handling service incidents so that services are always available, service incidents that occur can be completed based on agreed service level agreements and service requests can be handled in accordance with the agreed service level agreement to provide satisfaction for service users.	Manage / manage service requests, incidents and security. For example: a request to examine a computer problem is slow to operate, it must be checked, for example whether it is related to a problem in the computer or the existence of a virus. The request was received in the form of a service ticket. If the problem can be resolved at Level 1 management of service requests, incidents and security, then the ticket is closed. However, if it can't, it will be sent to Level 2, tickets on Level 1 are closed, but at Level 2 it will be opened ticket. Resolving this problem must still pay attention to the Service Level Agreement of the service.	

		(6) Close service and incident requests, and (7) Track status and present reports for continuous improvement.				
DSS03	Manage Problems	Management of IT Service Problems (Database Problems) (1) Identify and calcify problems based on certain criteria and procedures (2) Check and diagnose problems to find the root of the problem (3) Define known problems and the right solutions (4) Resolve and close the problem, and (5) Proactively manage problems (problem log for assessment).	Increase availability, improve service levels, reduce costs, and improve customer convenience and satisfaction by reducing the number of operational problems.	There needs to be a Division / Sub-Division that carries out management and management of operational problems related to IT services so that they can be resolved and do not recur.	Manage / manage problems or incidents that occur repeatedly to find solutions to problem solving and repairs so that these problems do not occur again.	
DSS04	Manage Continuity	Service Continuity / Service Sustainability (Business Continuity Plan) (1) Defining policies, objectives and scope of business continuity (2) Maintaining service sustainability strategies (3) Develop and establish a Business Continuity Plan (BCP) based on service sustainability strategies (4) Running, testing and reviewing BCP (5) Review, maintain and improve service continuity plans (6) Carry out training on service continuity plans: procedures (SOP), roles and responsibilities in service continuity plans	Continue critical business operations and maintain availability of information at a level acceptable to the enterprise in the event of a significant disruption.	There needs to be fields / sub-sectors that carry out management and management of service continuity / resilience and availability of information in accordance with service level agreements and plans for continuity / resilience of services that are in line with the requirements	Managing / managing the availability of IT services so that the existence of services, in accordance with the Service Level Agreement, continues (there is a business continuity plan). For example: SLA from NOC non-functioning is at most 1 hour, if the electricity company experiences black out and it feels that 1-hour SLA cannot be achieved, to achieve continuity of service then the NOC must be transferred to DRC so that 1 hour SLA is achieved Plan).	

		(7) Manage backup settings to maintain the existence of critical business information, and (8) Conducting BCP studies.				
DSS05	Manage Security Services	Management of Security Services for IT Services (1) Maintain services from malware (2) Manage network security and connectivity (3) Manage security endpoints (laptops, desktops, servers, mobile devices, network devices and software) (4) Manage user identity and access rights (5) Manage physical access to IT assets (6) Managing confidential / sensitive output documents and tools, and (7) Monitor infrastructure used to monitor security-related events.	Minimise the business impact of operational information security vulnerabilities and incidents.	There needs to be a Division / Sub-Division that conducts management and management of information security and incidents from the services presented. Security is carried out both in terms of infrastructure, systems, information, user access and other aspects.	Manage operational information security / information security disruption. For example: routine penetration test.	
DSS06	Manage Business Process Controls	Business Process Control Management (ISO 27001: Information security) (1) Align control activities in business processes with company goals (2) Control information processing (3) Manage roles, responsibilities, privileged access and level of authority (4) Managing errors and exceptions / objections	Maintain information integrity and the security of information assets handled within business processes in the enterprise or outsourced.	There needs to be a Division / Sub-Division that conducts management and management of control and safeguarding the integrity of information / business processes both within the organisation / company and with other parties outside the organisation / company (third parties).	Manage / manage existing business processes: business transactions; roles, responsibilities, access to services; permanent and outsourced workers, transaction logs, and information. This control can be carried out in certain forms or controls within a certain period of time that has been agreed upon. The point is to define and implement appropriate business process controls to ensure information related to business processes carried out by the organisation or by third parties maintained their integrity and security of information assets	

		(5) Ensuring information traceability and accountability, and (6) Securing information assets that can be accessed by the business through approved methods, including information in electronic form, information in the form of manual documents and information in the process of transfer / delivery.			handled in business processes whether managed by organisations or third parties.	
MEA01	Monitor, Evaluate and Assess Performance and Conformance	Monitor, Evaluate and Evaluate Performance and Compliance with the Achievement Goals (1) Establish an approach to monitoring the suitability of solutions and services with company objectives (2) Establishing performance and suitability of targets (3) Collect and process performance data and target conformity (4) Analyze and report on performance, and (5) Ensuring the implementation of performance improvement actions.	Provide transparency of performance and conformance and drive achievement of goals.	There needs to be a Division / Sub-Division that conducts supervision, evaluates and evaluates the performance / performance and suitability of the implementation of activities / services with the goal of achievement. Performance appraisal and suitability of activities / services carried out is to ensure that the processes of activities / services are carried out in accordance with the objectives and measure (success) that has been determined by stakeholders.	Supervision, evaluation and evaluation of performance / performance in accordance with the Service Level Agreement.	

MEA02	Monitor, Evaluate and Assess the System of Internal Control	Monitor, Evaluate and Assess Internal Control Systems (1) Monitor the control of internal service compliance and IT framework with company objectives (2) Conduct a review of the effectiveness of controlling business processes (3) Conduct an assessment of self-control of stakeholders and process owners (4) Identify and report lack of control to stakeholders (5) Ensure that service providers are independent and qualified (6) Planning a guarantee initiative (7) Establish the scope of the guarantee initiative, and (8) Carry out guarantee initiatives.	Obtain transparency for key stakeholders on the adequacy of the system of internal controls and thus provide trust in operations, confidence in the achievement of enterprise objectives and an adequate understanding of residual risk.	It is necessary to have a Division / Sub-Division that conducts supervision, evaluation and assessment of the organisation / company internal control system, namely monitoring, evaluating and conforming the processes carried out, resources used, and information generated with the requirements of the internal control system organisation / company.	Internal organisation / company supervision, evaluation and evaluation related to the suitability of IT services implementation with SOPs and internal policies (internal audit).	
MEA03	Monitor, Evaluate and Assess Compliance with External Requirements	Monitor, Evaluate and Assess Compliance with External Requirements (1) Identifying external compliance requirements: national and international regulations, and other regulations in an IT perspective (2) Optimizing responses to external needs: considering adoption and adaptation of industry standards, good practices, and guiding best practices (3) Confirming external compliance (policies, principles, standards, procedures and	Ensure that the enterprise is compliant with all applicable external requirements.	There needs to be a Sector / Sub-Sector that conducts supervision, evaluation and conformity assessment of services with external requirements that have been identified and determined.	Supervision, evaluation and assessment of the implementation of IT services are based on external requirements / best practices. For example: based on ISO 27001, ISO 9001, and so on.	

		methodologies) with legal, regulatory and contract requirements, and (4) Obtain a guarantee of external compliance.				

Appendix 6

Analysis of Proposed Organisational Structure Using COBIT 5

Mapping COBIT reference process to the proposed CDII structure (3 divisions):

Id Process	Process Name	Division Of It Development			Division Of It Development			Division Of It Operation			Subdivision Of Administration
		Subdivision Of Planning And It Architecture	**Subdivision Of Policy, Compliance And Risk Management**	**Subdivision Of Business Relationship And Program Management**	**Subdivision Of Internal System Development**	**Subdivision Of Public Information System Development**	**Subdivision Of Infrastructure Development**	**Subdivision Of It Operational**	**Subdivision Of It Technical Support**	**Subdivision Of Data Management**	
GOVERNANCE DOMAIN											
PROCESSES FOR GOVERNANCE OF ENTERPRISE IT - EVALUATE, DIRECT AND MONITOR											
EDM01	Ensure Governance Framework Setting And Maintenance	X									
EDM02	Ensure Benefits Delivery	X		X							
EDM03	Ensure Risk Optimisation		X								
EDM04	Ensure Resource Optimisation	X									

EDM05	Ensure Stakeholder Transparency	X		X							
MANAGEMENT DOMAIN											
ALIGN, PLAN AND ORGANISE											
APO01	Manage The It Management Framework		X								
APO02	Manage Strategy		X	X							
APO03	Manage Enterprise Architecture	X									
APO04	Manage Innovation	X									
APO05	Manage Portfolio	X		X							
APO06	Manage Budget And Costs	X									
APO07	Manage Human Resources	X									
APO08	Manage Relationships	X		X							
APO09	Manage Service Agreements	X		X							

APO10	Manage Suppliers			X							
APO11	Manage Quality	X									
APO12	Manage Risk		X								
APO13	Manage Security		X								
BUILD, ACQUIRE AND IMPLEMENT											
BAI01	Manage Programmes And Projects				X	X	X				
BAI02	Manage Requirements Definition				X	X	X				
BAI03	Manage Solutions Identification And Build				X	X	X				
BAI04	Manage Availability And Capacity				X	X	X				
BAI05	Manage Organisational Change Enablement				X	X	X				
BAI06	Manage Changes				X	X	X				
BAI07	Manage Change Acceptance And Transitioning				X	X	X				

BAI08	Manage Knowledge				X	X	X	X	X	X	
BAI09	Manage Assets				X	X	X				
BAI10	Manage Configuration				X	X	X				
DELIVER, SERVICE AND SUPPORT											
DSS01	Manage Operations							X		X	
DSS02	Manage Service Requests And Incidents								X		
DSS03	Manage Problems							X	X		
DSS04	Manage Continuity							X		X	
DSS05	Manage Security Services							X	X		
DSS06	Manage Business Process Controls							X		X	
MONITOR, EVALUATE AND ASSESS											
MEA01	Monitor, Evaluate And Assess Performance And Conformance	X									

MEA02	Monitor, Evaluate And Assess The System Of Internal Control	X		X							
MEA03	Monitor, Evaluate And Assess Compliance With External Requirements	X		X							

Mapping COBIT reference process to the proposed CDII structure (2 divisions):

Id Process	**Process Name**	**Division Of It Planning And Development**			**Division Of Operational And It Service Management**			**Subdivision Of Administration**
		Subdivision Of It Architecture Planning And It Governance	**Subdivision Of Business Relationship And Program Management**	**Subdivision Of Information System Development**	**Subdivision Of It Operation**	**Subdivision Of It Technical Support**	**Subdivision Of Data Management**	
GOVERNANCE DOMAIN								
Processes for Governance of Enterprise IT - Evaluate, Direct and Monitor								
EDM01	Ensure Governance Framework Setting and Maintenance	x						
EDM02	Ensure Benefits Delivery	x	x					
EDM03	Ensure Risk Optimisation	x						

EDM04	Ensure Resource Optimisation	x						
EDM05	Ensure Stakeholder Transparency	x	x					
MANAGEMENT DOMAIN								
Align, Plan and Organise								
APO01	Manage the IT Management Framework	x						
APO02	Manage Strategy	x	x					
APO03	Manage Enterprise Architecture	x						
APO04	Manage Innovation	x						
APO05	Manage Portfolio	x	x					
APO06	Manage Budget and Costs	x						
APO07	Manage Human Resources	x						
APO08	Manage Relationships		x					
APO09	Manage Service Agreements		x					

APO10	Manage Suppliers		x					
APO11	Manage Quality	x						
APO12	Manage Risk	x						
APO13	Manage Security	x						
Build, Acquire and Implement								
BAI01	Manage Programmes and Projects		x	x				
BAI02	Manage Requirements Definition		x	x				
BAI03	Manage Solutions Identification and Build			x				
BAI04	Manage Availability and Capacity			x				
BAI05	Manage Organisational Change Enablement		x	x				
BAI06	Manage Changes		x	x				
BAI07	Manage Change Acceptance and Transitioning		x	x				

BAI08	Manage Knowledge			x	x	x	x	
BAI09	Manage Assets			x				
BAI10	Manage Configuration			x				
Deliver, Service and Support								
DSS01	Manage Operations				x		x	
DSS02	Manage Service Requests and Incidents					x		
DSS03	Manage Problems				x	x		
DSS04	Manage Continuity				x		x	
DSS05	Manage Security Services				x	x		
DSS06	Manage Business Process Controls				x		x	
Monitor, Evaluate and Assess								
MEA01	Monitor, Evaluate and Assess Performance and Conformance	x						

MEA02	Monitor, Evaluate and Assess the System of Internal Control	x	x					
MEA03	Monitor, Evaluate and Assess Compliance with External Requirements	x	x					